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Krom

Hand-wrought ironwork



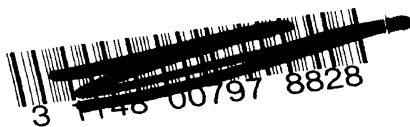
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HAND-WROUGHT IRONWORK

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A BOOK OF PROJECTS

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PREFACE

During the author's experience as a shop teacher and later as an administrator, he sensed a growing need for suitable wrought-iron projects; those which could be completed by boys of elementary, junior high school, and high school age; also projects that could be adapted for the home workshop and extracurricular activities.

With the ever present trend and advancement in modern education, no book or subject should be published without keeping this in mind. It should be flexible enough to provide for individual differences. The slow student must be considered; a large majority of the class will show a central tendency, while every group has a few rapid and superior pupils. Both extremes, as well as the normal group, will find projects suited to their taste and ability.

The general shop is rapidly gaining favor; here, we can see any number of different activities in progress. A shop of this type presents a wonderful opportunity for the diversification of the medium, and for the diversification within the medium. The wrought-iron projects in this book are presented in a clear, concise, and understandable manner. Drawings and an information sheet for each project outline the most difficult steps. However, provision is made with each project for a student to use his initiative in procedure, design, construction, and finish.

The complex problem of finding recreation and activities that will benefit both the individual and the community can be approached by work of this nature. The schools can prepare the child to cope with this life situation when it presents itself. One of the most effective ways of realizing this end is through the organization of an extracurricular activity program.

The contents of this work lends itself nobly to this end. How? By the formation of a Wrought-Iron Club. Inexpensive material and only a few tools are required to do this fascinating work in true craftsman style. The projects contained in this book should be a welcome addition to any school or home shop. Attitudes and skills are developed by challenging the individual's ability and, at the same time, demanding only a minimum of time.

EDWARD F. KROM

ACKNOWLEDGMENT

Acknowledgment is appreciatively extended to Mr. Ray E. Haines, Professor of Education, Director of Instructional Shops, Department of Vocational Education, School of Education, New York University, for his assistance and helpful suggestions.

THE AUTHORS

CONTENTS

Preface	5
Acknowledgment	6
Finishes	9
<i>Projects:</i>	
Candlestick	10
Candelabra	12
Table Pedestal	14
Table Pedestal	16
Plant Stand	18
Table Pedestal	20
Plant Stand	22
Wall Bracket	24
Wall Bracket	26
Wall Bracket	28
Wall Bracket	30
Table	32
Serving Tray	34
Occasional Table	36
Taboret	38
Occasional Table	40
Table	42
End Table	44
Door Knocker	46
Foot Scraper	48
Smoking Stand	50
Smoking Stand	52
Smoking Stand	54

HAND-WROUGHT IRONWORK

FINISHES

The finishing of a wrought-iron project is the last process undertaken, but it is of utmost importance, as it brings out the full beauty of the project.

Individual taste and the type of article made should be the determining factor in the kind of finish to be used. It may be a modern finish, or an old rustic finish, or the article may be left in its natural state and merely lacquered. A project may show good design and fine craftsmanship in the rough, but its entire beauty may be lost with the wrong finish. Since projects made from wrought iron rust when exposed to the air if not finished, each project should be completed properly by applying a suitable finish.

Following are a few of the most popular finishes for metalwork projects, and their method of application.

When a project is to be left in its natural color, all that has to be done is to apply a coat of clear lacquer over the surface, making sure it is spread evenly. If a certain color is desired, lacquer may be used. Many beautiful schemes can be worked out when using lacquer, one of which is blowing on colored bronze while the lacquer is still wet. This is done by the use of a small atomizer or a Flit gun, and when dry, it has a beautiful two-toned color effect.

Another beautiful finish is obtained by peening the surface of the metal before it is bent and assembled. Then, a thin coat of linseed oil is applied and exposed over a flame. After the metal has cooled, the darkened surfaces are rubbed with a piece of fine emery cloth. This will remove the blackened portion from the high spots leaving the bottom of the impressions with a dark, black background. Finally, the entire surface of the metal is brushed with a coat of clear lacquer.

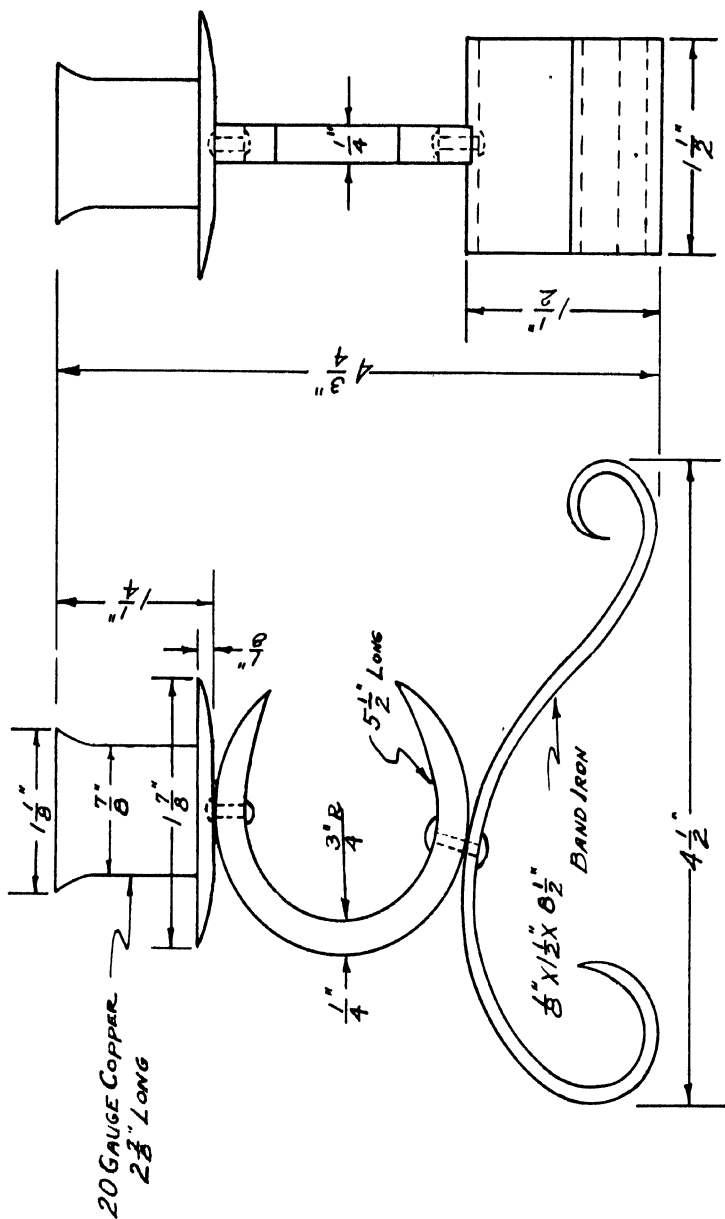
The foregoing are a few of the most popular finishes for metal projects. Further detailed information as to other finishes can be found in many good books on the subject of metal finishes.

References:

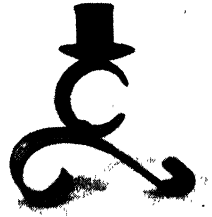
Newell, A. C., *Coloring, Finishing, and Painting Wood* (Manual Arts Press, Peoria).

Willoughby, G. A., and Chamberlain, D. G., *General Shop Handbook* (Manual Arts Press, Peoria).

CANDLE STICK



CANDLESTICK

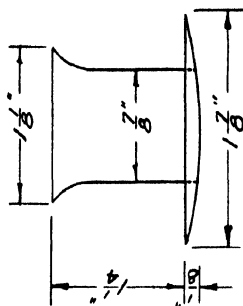


Operations:

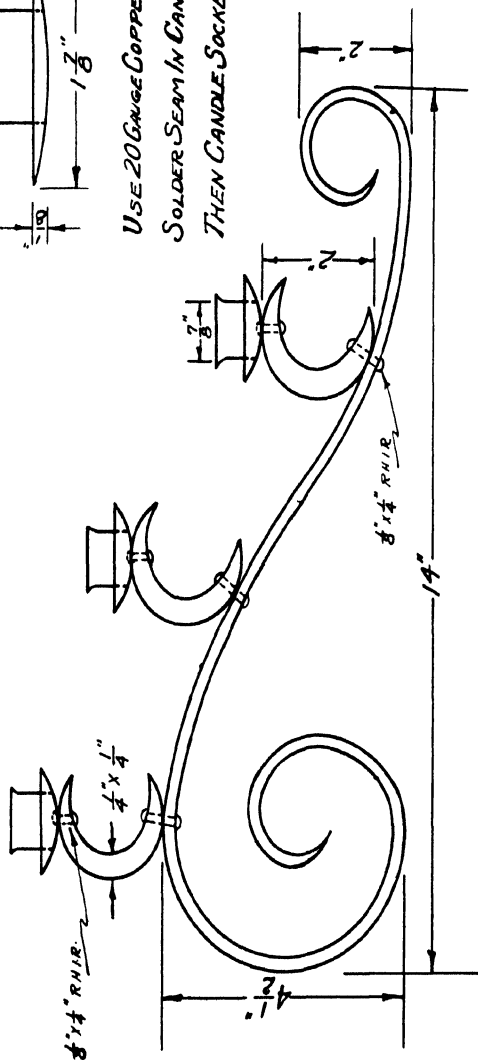
1. Draw full-scale layout of pieces.
2. Cut base, and shape.
3. Bend and file crescent.
4. Drill and rivet crescent to base.
5. Shape the candleholder.
6. Drill and rivet candleholder to crescent.
7. Apply finish.

Reference:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee)



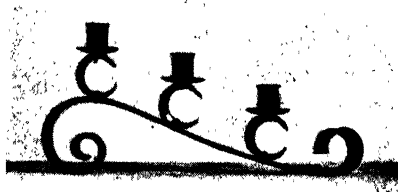
USE 20 GAUGE COPPER 2 7/8" LONG
SOLDER SEAM IN CANDLE SOCKET,
THEN CANDLE SOCKET TO DRIP CUP



CRESCENT 8" x 4" x 2 1/2" BAND IRON
SCROLL 7/8" x 1 3/4" x 15" BAND IRON

CANDELABRA

CANDELABRA



Operations:

1. Draw full-scale layout of pieces.
2. Determine length of piece for base.
3. Cut base, and shape ends.
4. Shape the candleholders.
5. Solder candle socket to drip cup, as shown on drawing.
6. Bend and file crescents.
7. Drill holes in drip cups.
8. Drill and rivet crescents to base.
9. Fasten candleholders on crescents.
10. Apply finish.

References:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

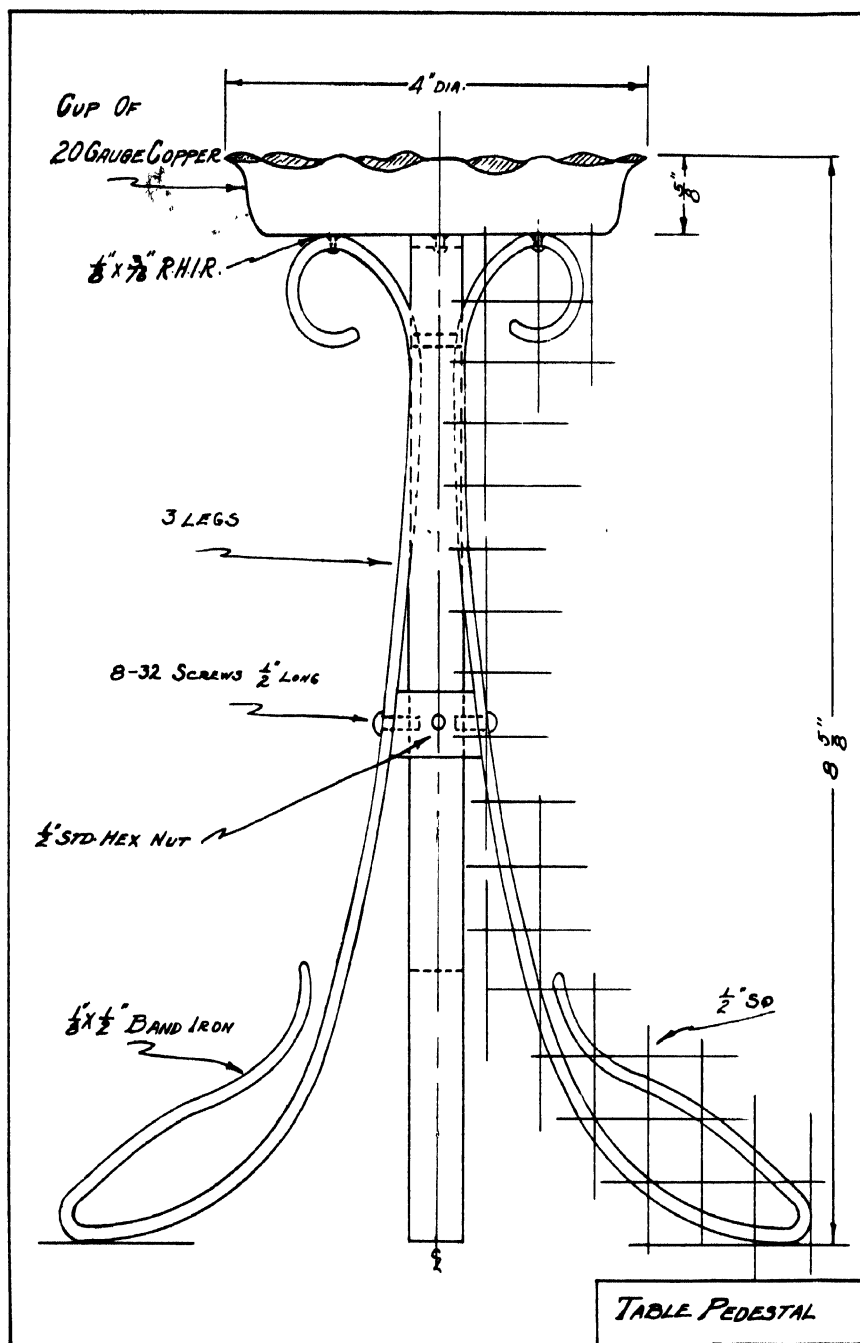
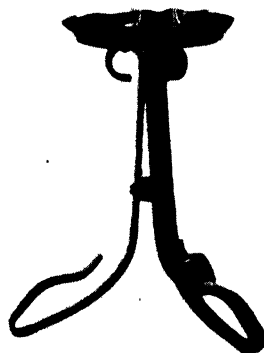


TABLE PEDESTAL*Operations:*

1. Draw full-scale layout of pieces.
2. Determine length of pieces.
3. Cut pieces to length.
4. Bend pieces to shape.
5. Locate and drill holes.
6. Tap and drill holes in hex. nut.
7. File taper on three sides of nut.
8. Assemble pieces.
9. Make tray, and rivet.
10. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

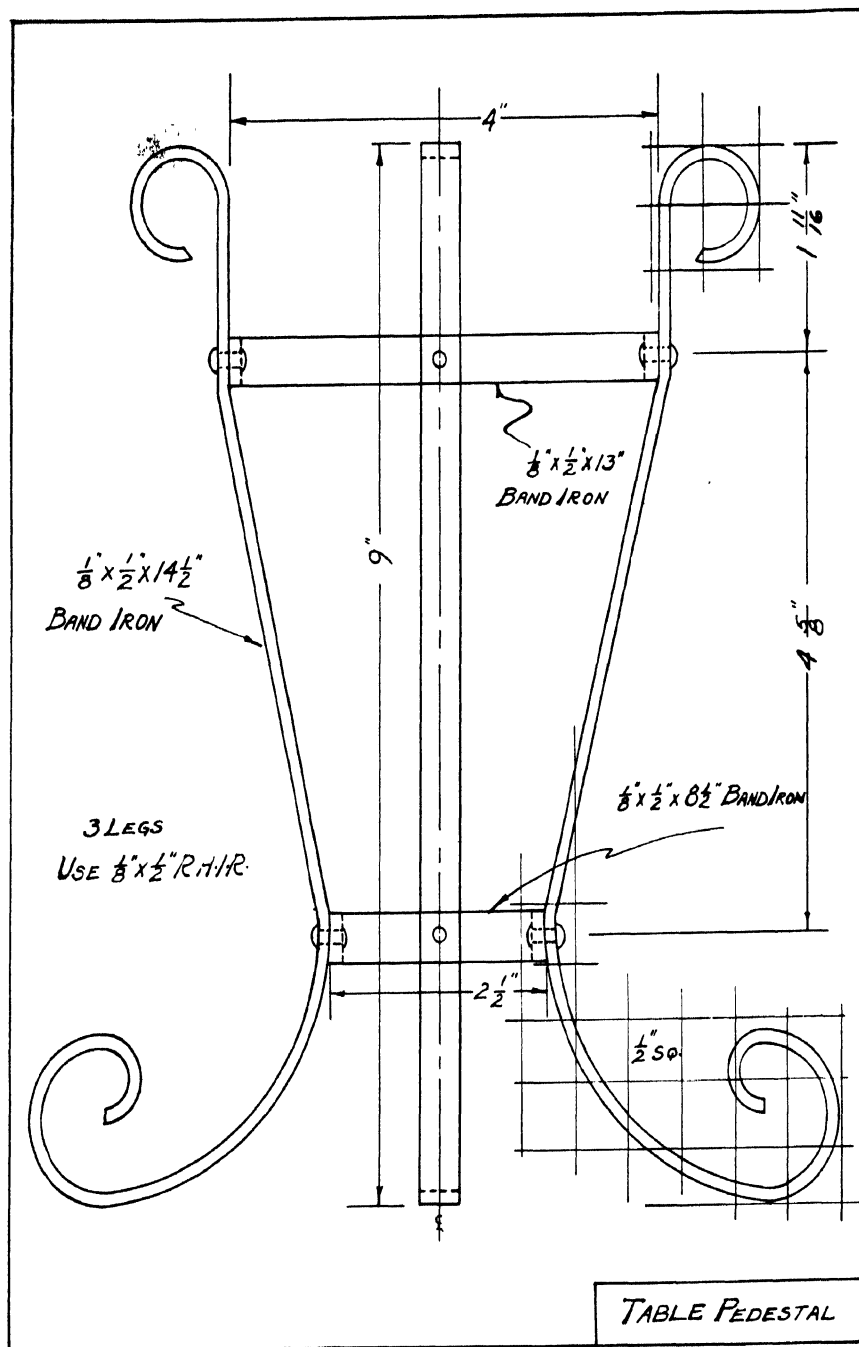
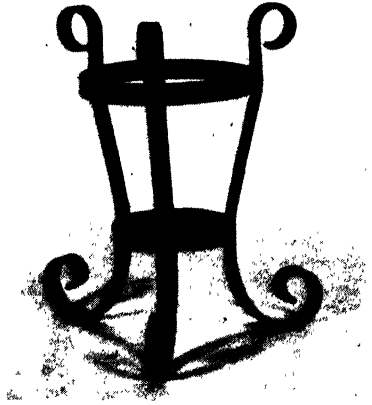


TABLE PEDESTAL*Operations:*

1. Draw full-scale layout for legs.
2. Determine the length of each piece, and cut.
3. File edges evenly.
4. Form ends of the pieces.
5. Make a small and a large ring.
6. Locate and drill holes in the pieces.
7. Rivet rings to legs.
8. Apply finish.

References:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

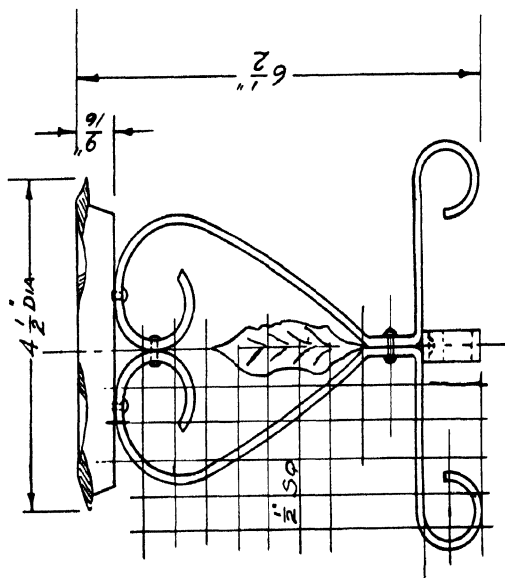
20 GAUGE SHEET METAL
RIVETED TO BASE

LEAF OF 20 GAUGE COPPER

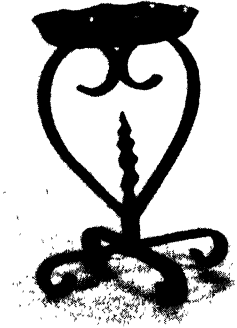
FASTEN FROM BOTTOM WITH
8-32 X $\frac{1}{2}$ RH I.M.S.

PLANT STAND

USE $\frac{1}{8}$ X $\frac{1}{2}$ " BAND IRON



PLANT STAND



Operations:

1. Draw full-size layout of pieces.
2. From the layout, determine the sizes of each piece.
3. Shape pieces as required, top and bottom.
4. Locate and drill holes.
5. Rivet pieces together with leaf between.
6. Drill and tap upright so other foot may be attached with screw.
7. Make metal cup.
8. Locate holes in top, and drill.
9. Rivet tray in place.
10. Apply finish.

NOTE: Leaf may be omitted if desired.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

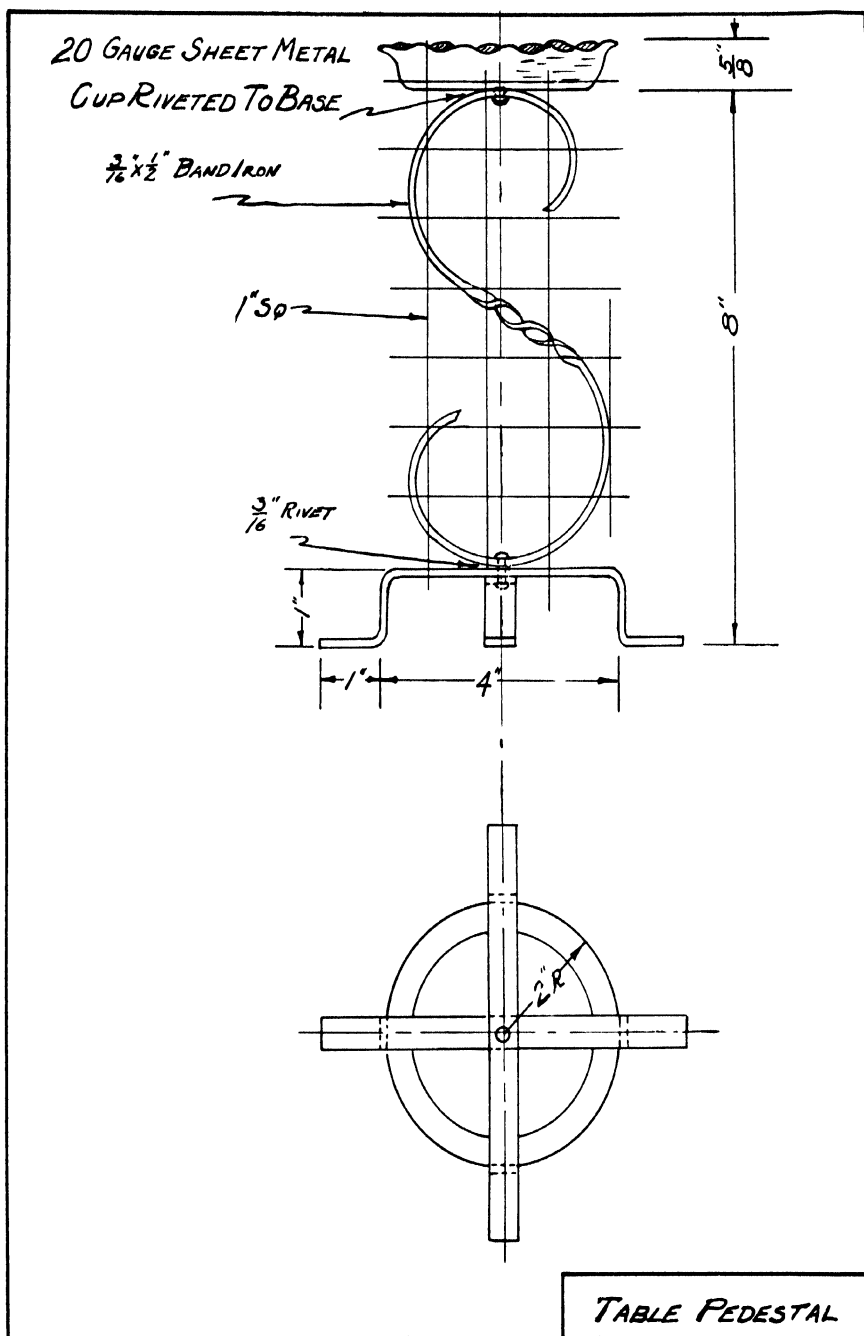
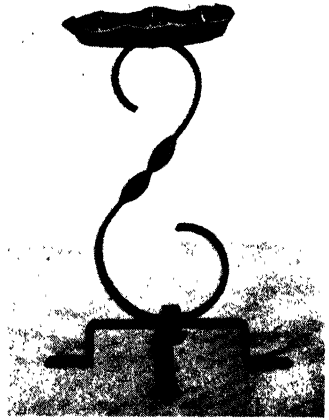
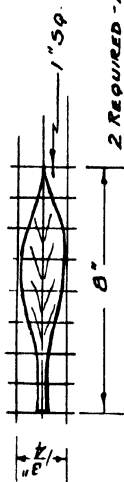


TABLE PEDESTAL*Operations:*

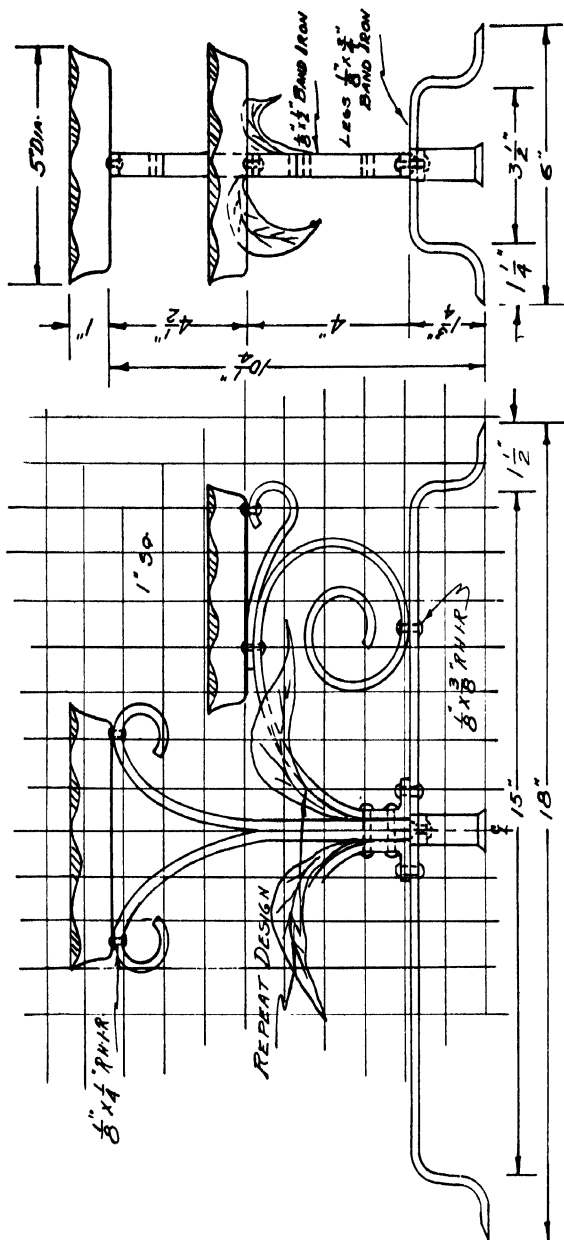
1. Draw design of pieces on cross-section paper.
2. Determine the length of each piece, and cut.
3. Shape ends of bottom pieces.
4. Locate and drill holes on two bottom pieces.
5. Mark off portion to be twisted, and twist.
6. Shape upright piece.
7. Locate and drill holes on support.
8. Rivet pieces together.
9. Make metal tray. Fasten tray.
10. Apply finish.

Reference:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).

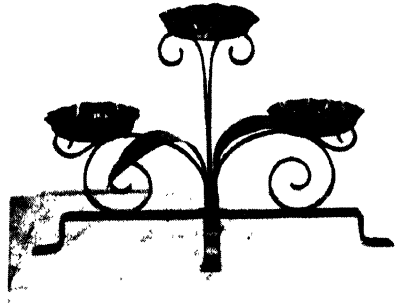


2 REQUIRED - 20 GAUGE COPPER



PLANT STAND

PLANT STAND

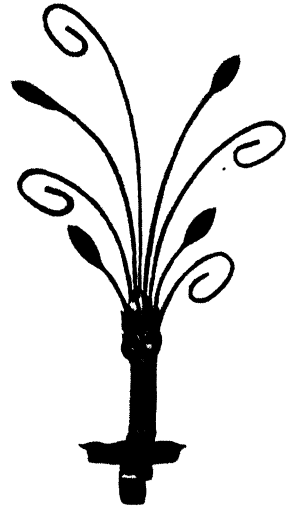


Operations:

1. Draw full-scale layout of pieces.
2. Determine length of pieces for base.
3. Cut base pieces to length. Bend and forge ends.
4. From layout, determine the length of the pieces, and cut.
5. File the ends evenly.
6. Shape pieces, and locate holes and drill.
7. Make copper leaves.
8. Assemble pieces, and rivet.
9. Make trays. Use 7 by 7-in., 20-gauge copper.
10. Place trays, and rivet.
11. Apply finish.

References:

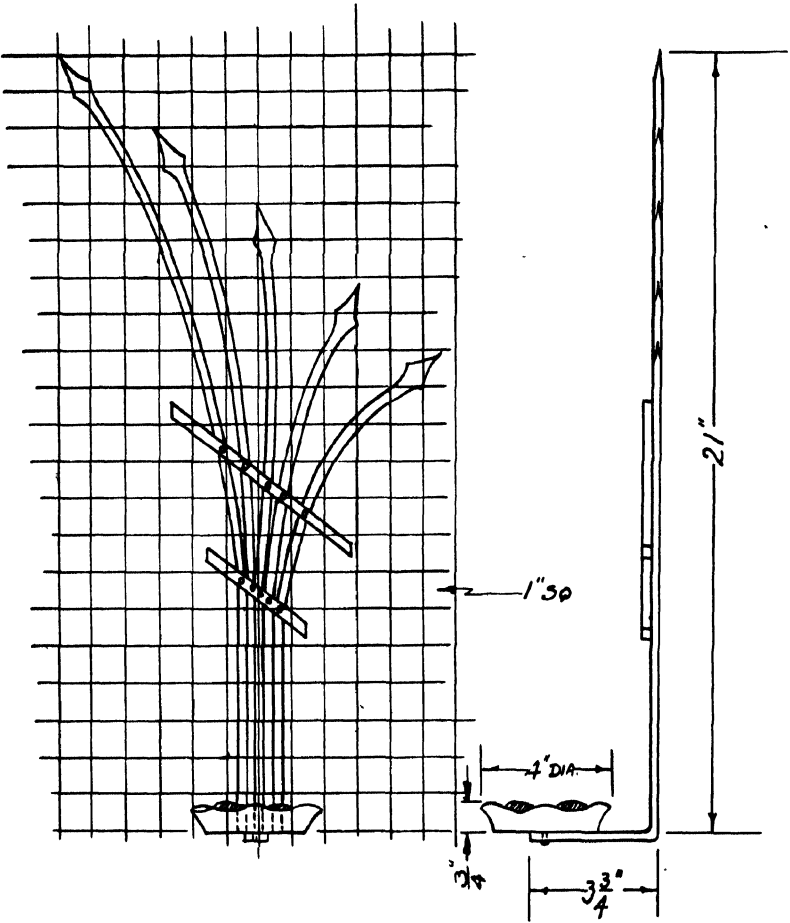
- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

WALL BRACKET*Operations:*

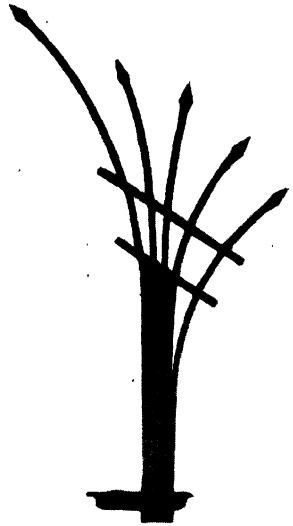
1. Draw full-scale layout of pieces.
2. Determine the length of each piece, and cut.
3. Shape ends as required.
4. Locate and drill holes.
5. Rivet pieces together.
6. Purchase or make tray, and fasten with $\frac{1}{8}$ by $\frac{1}{4}$ -in. roundhead rivet.
7. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials* (Bruce, Milwaukee).



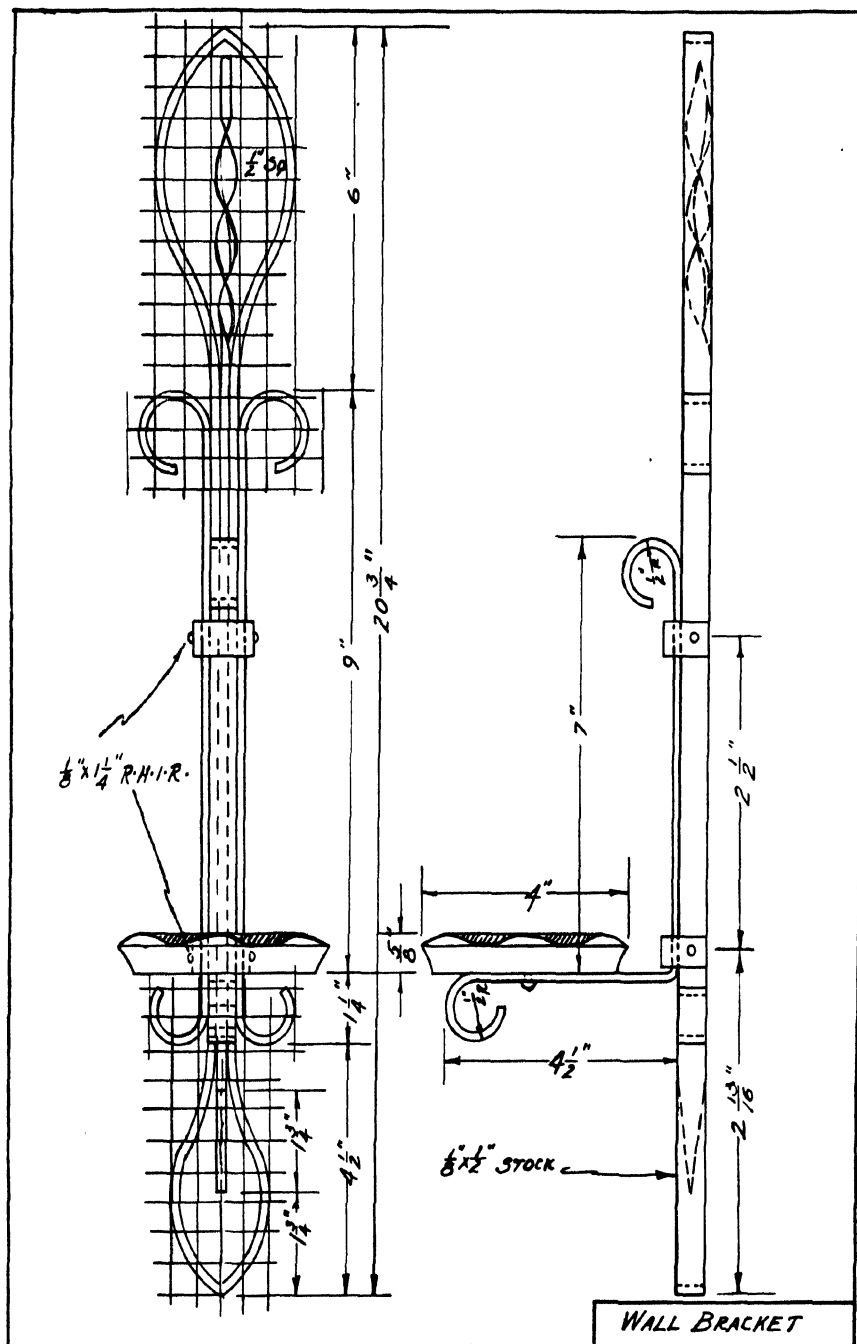
WALL BRACKET

WALL BRACKET*Operations:*

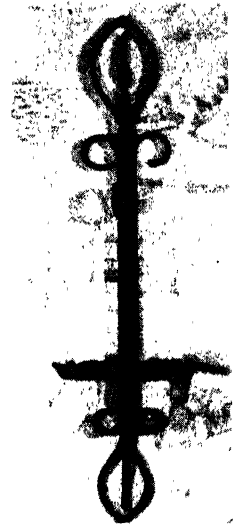
1. Draw full-scale layout.
2. Determine the length of each piece, and cut.
3. Shape pieces as required.
4. Locate and drill holes in pieces.
5. Fasten pieces together with $\frac{1}{8}$ by $\frac{3}{8}$ -in. roundhead rivets.
6. Purchase or make tray, and fasten in place with $\frac{1}{8}$ by $\frac{3}{8}$ -in. roundhead rivet.
7. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



WALL BRACKET



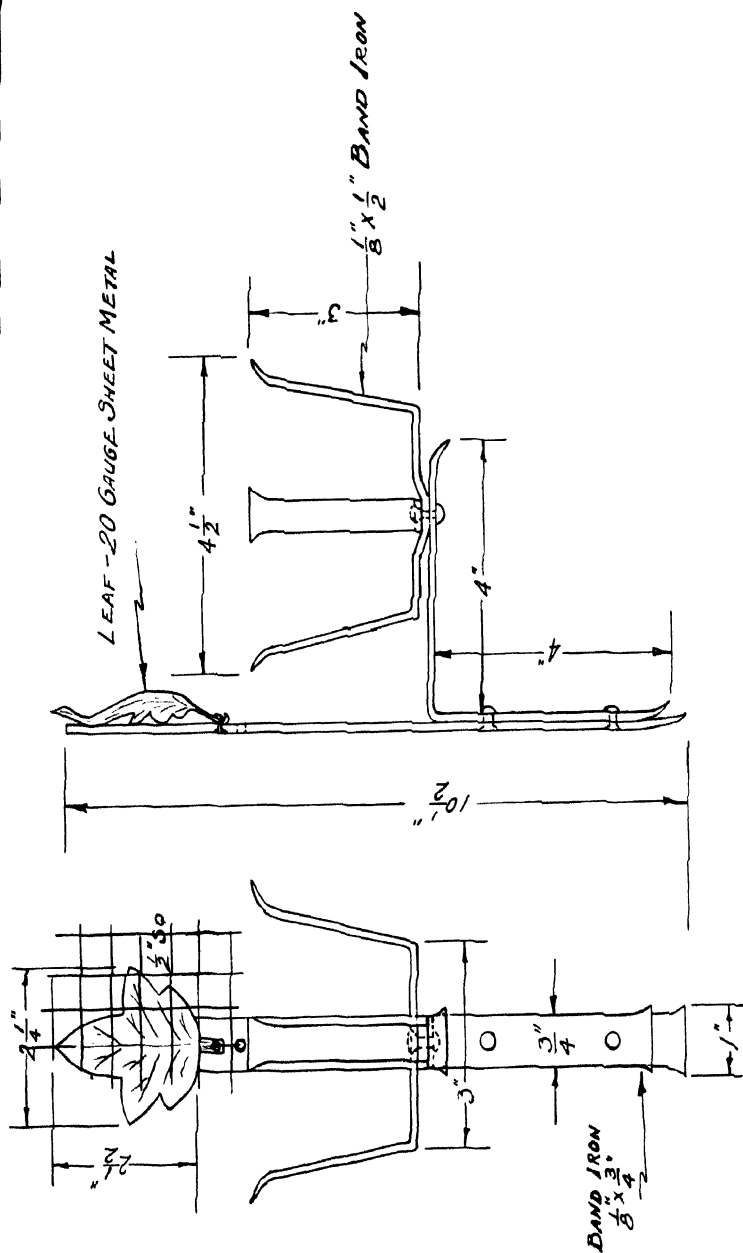
Operations:

1. Draw full-scale layout of pieces. Determine the length of each piece, and cut.
2. Shape pieces as required.
3. Mark off portion to be twisted, taper both ends, and twist.
4. Make U-shaped pieces. Locate and drill holes in pieces.
5. Rivet pieces together.
6. Purchase or make tray, and fasten with $\frac{3}{8}$ by $\frac{1}{4}$ -in. roundhead rivet.
7. Apply finish.

References:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

WALL BRACKET

 $5\frac{3}{8}$ " RH. RIVETS

WALL BRACKET

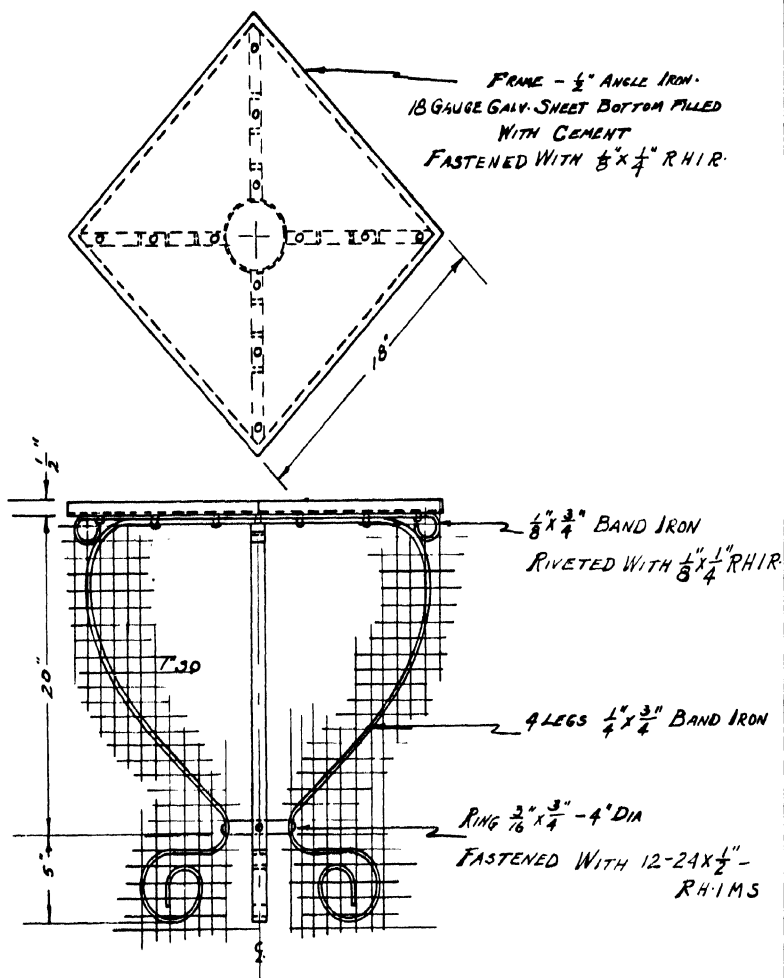


Operations:

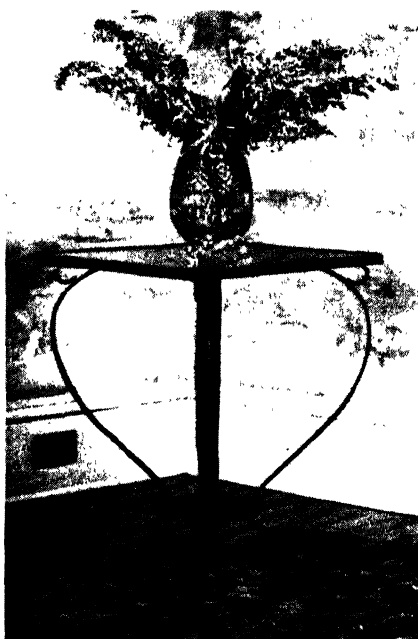
1. Determine the length of each piece from the drawing.
2. Cut pieces to length, and flare ends.
3. Shape pieces as required.
4. Locate and drill holes in pieces.
5. Fasten leaf at top.
6. Rivet pieces together.
7. Apply finish.

References:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



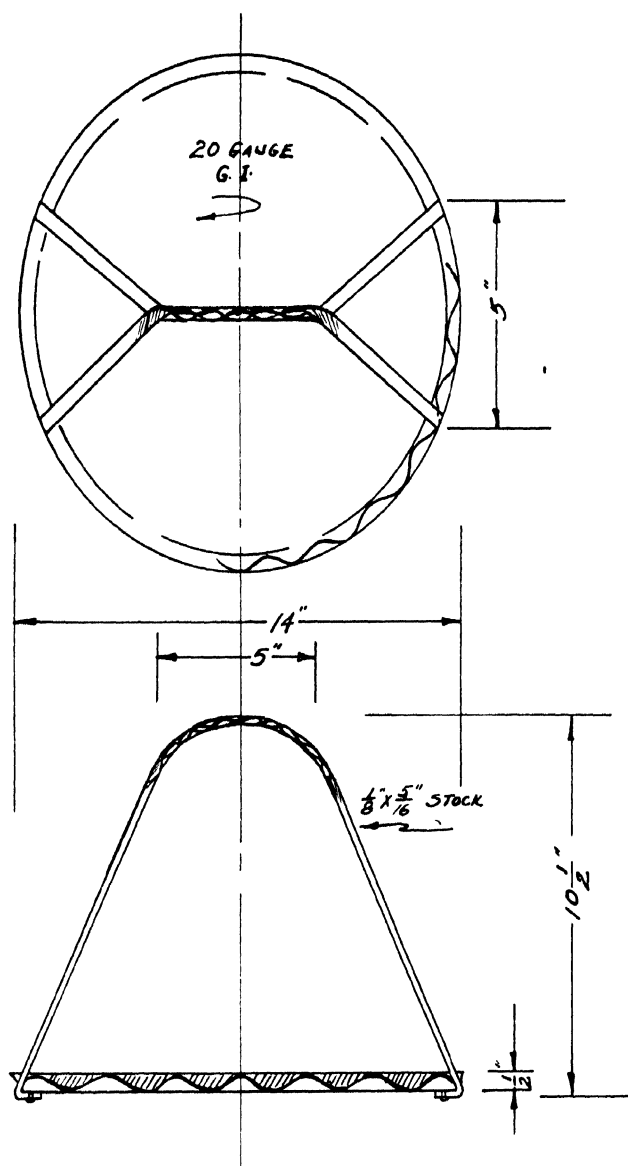
TABLE

TABLE*Operations:*

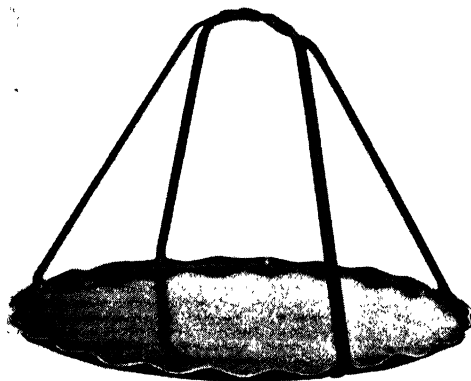
1. Draw full-scale layout of legs.
2. Determine the length of pieces, and cut to proper length.
3. Bend pieces as required.
4. Locate and drill holes in pieces.
5. Make ring. Rivet ring to legs.
6. Make tray for top.
7. Rivet legs to top. Fill with cement.
8. Apply finish.

Reference:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).



SERVING TRAY

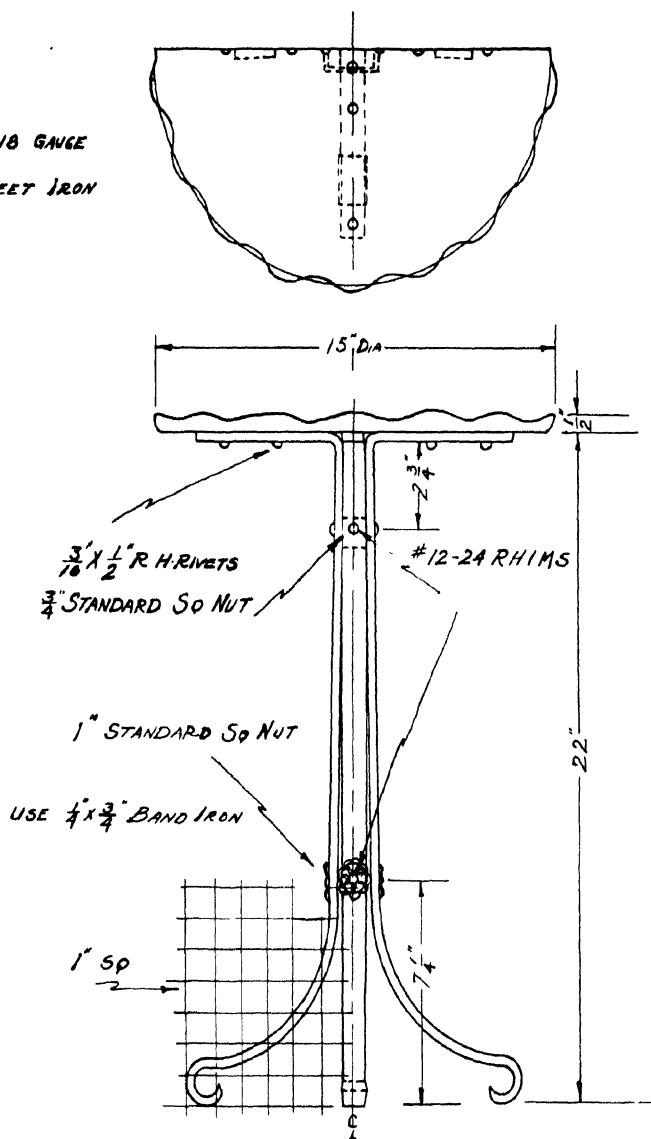
SERVING TRAY**Operations:**

1. Obtain a piece of 20-gauge sheet iron, 14½ in. square.
2. Find the center of the metal, and scribe a circle.
3. Cut the disk with a pair of curved snips.
4. Smooth the edges with a file.
5. Measure in ½ in. from the edge, and scribe another circle.
6. Scallop edge as shown.
7. Determine the length of each handle piece.
8. Mark off portion to be twisted, and twist together.
9. Shape top and sides of each piece.
10. Locate and drill holes in pieces.
11. Rivet pieces together.
12. Apply finish.

References:

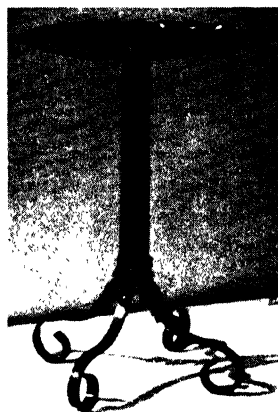
- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Welch, R. L., *Elements of Sheet Metal Work* (Bruce, Milwaukee).

TOP 18 GAUGE
SHEET IRON



OCCASIONAL TABLE

OCCASIONAL TABLE

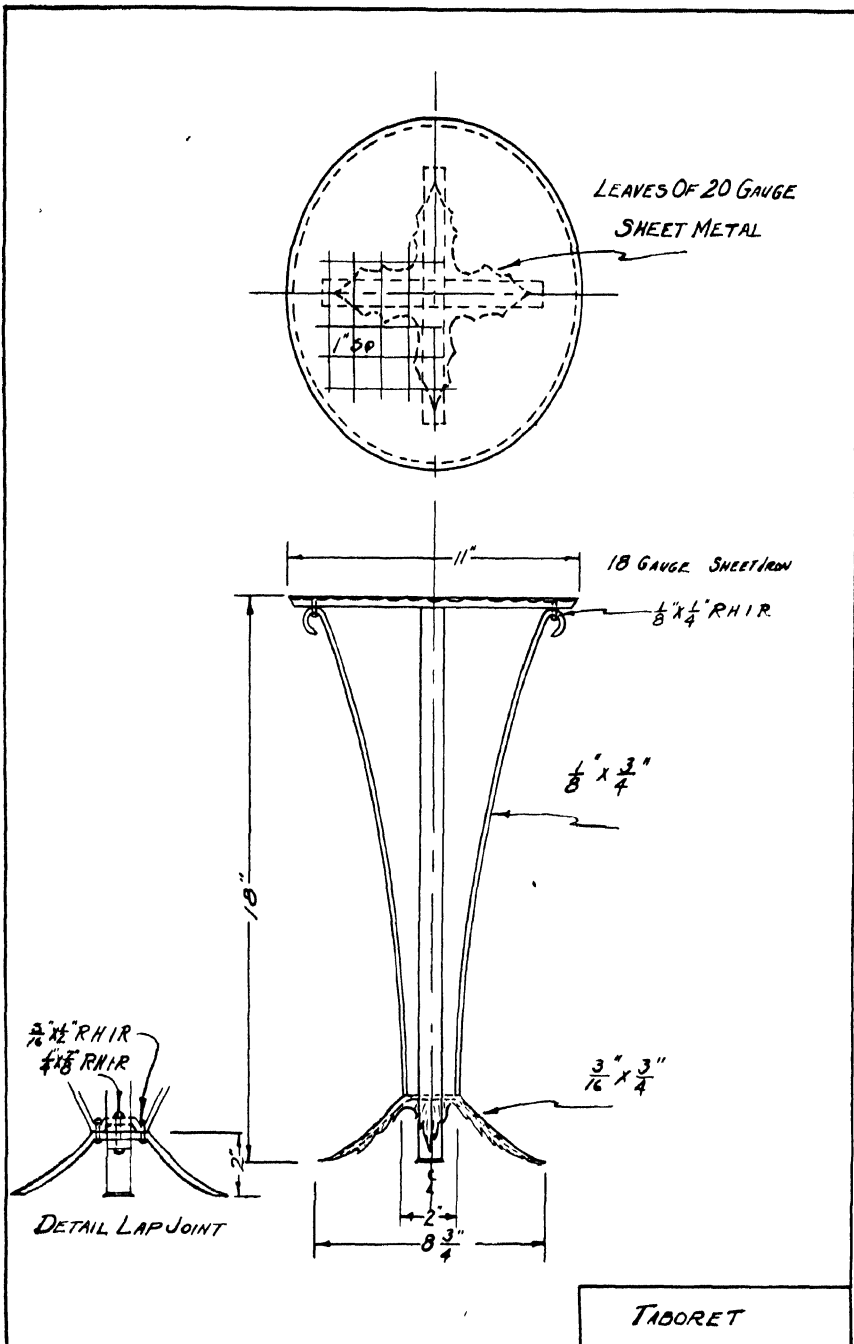


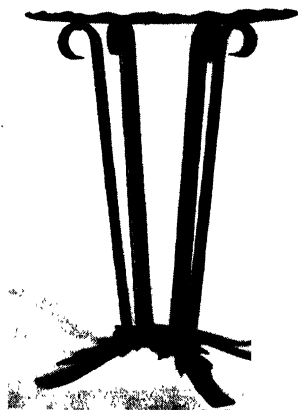
Operations:

1. Draw full-scale layout of pieces.
2. Cut pieces to length, and file ends square.
3. On each piece, mark off portion to be twisted.
4. Form loops on ends of the pieces.
5. Bend tops of pieces at right angles in direction opposite to the loops.
6. Locate and drill holes in the pieces.
7. Use $\frac{3}{4}$ -in. Standard square nut for upper fastening.
8. Use 1-in. Standard square nut for lower fastening.
9. Assemble with 12/24 roundhead machine screws.
10. Cut a 15 $\frac{1}{2}$ -in. square of sheet iron for top, and shape as required.
11. Fasten legs to the top, using flathead rivets.
12. Apply a finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

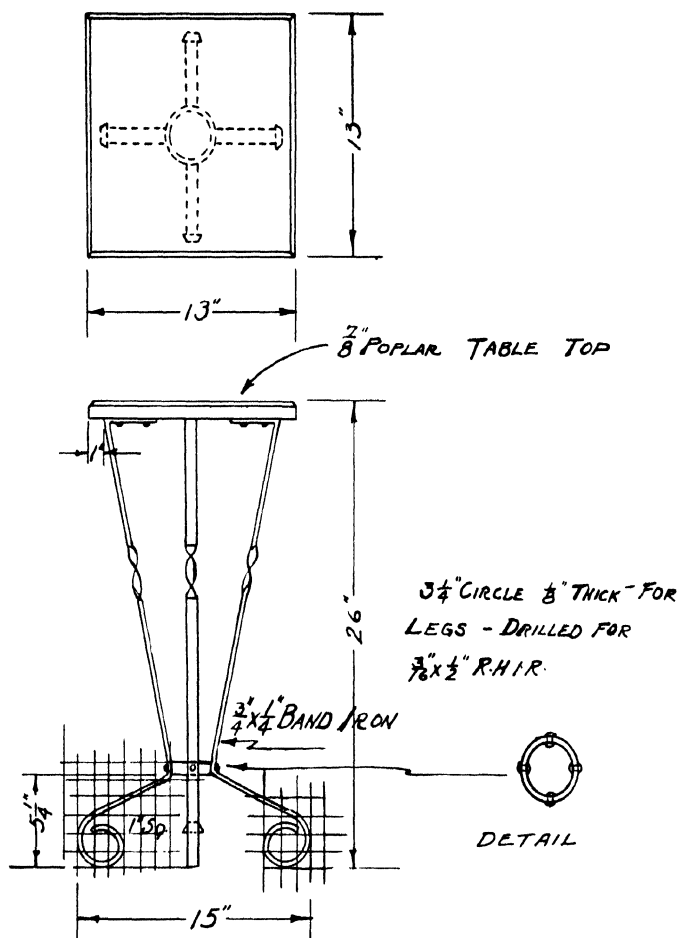


TABORET*Operations:*

1. Obtain a piece of 18-gauge sheet iron, 12 in. square.
2. Find the center of the metal, and scribe a circle.
3. Cut the disk with a pair of curved snips.
4. Smooth the edges with a file.
5. Measure in $\frac{1}{2}$ in. from the edges, and scribe another circle.
6. Scallop edge.
7. Locate and drill holes.
8. Determine the length of each piece, and cut.
9. Shape pieces as drawn on paper.
10. Locate and drill holes in pieces.
11. Obtain or make ornamental leaves.
12. Rivet pieces together.
13. Rivet top to base.
14. Apply finish.

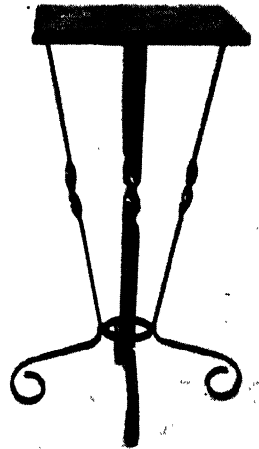
References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



OCCASIONAL TABLE

OCCASIONAL TABLE

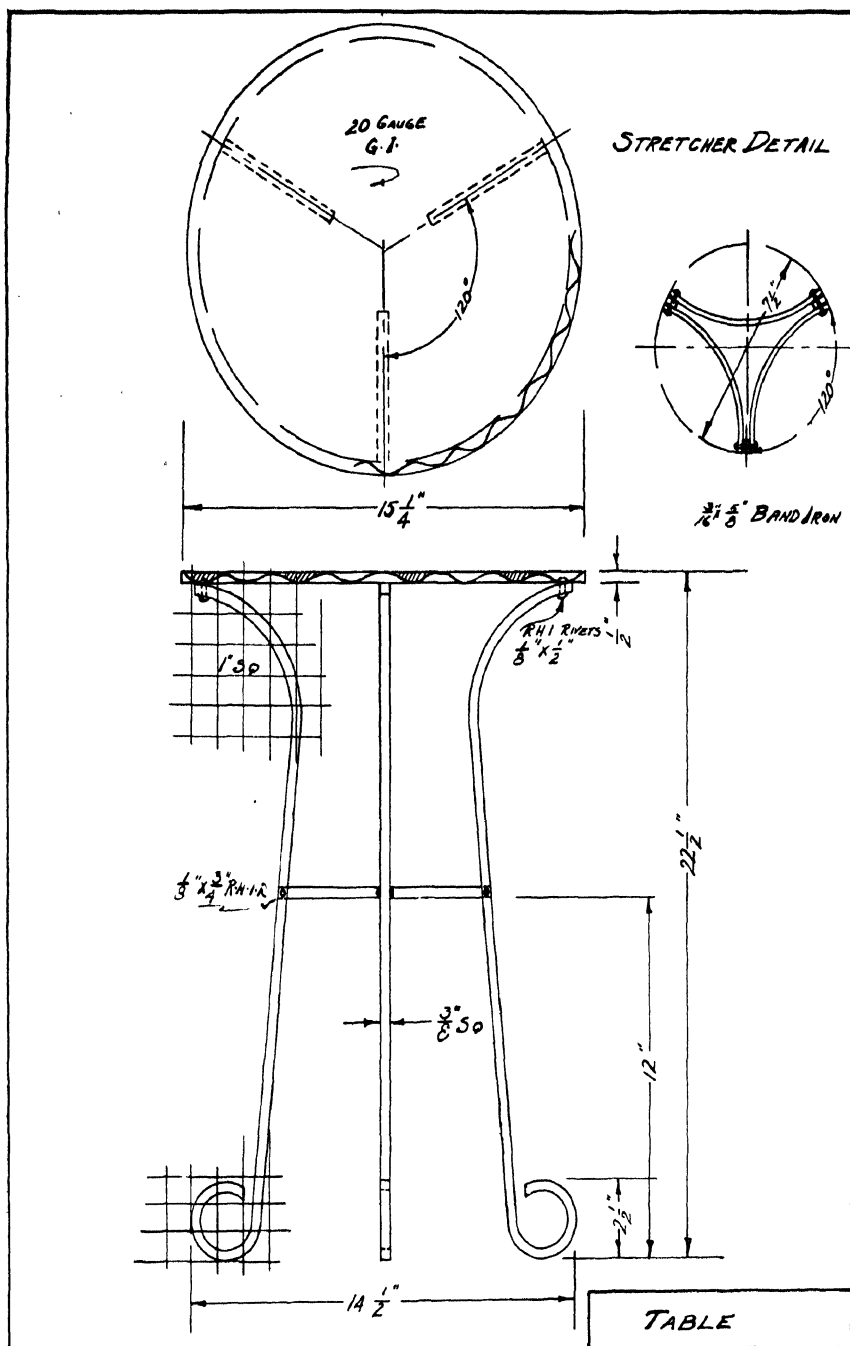


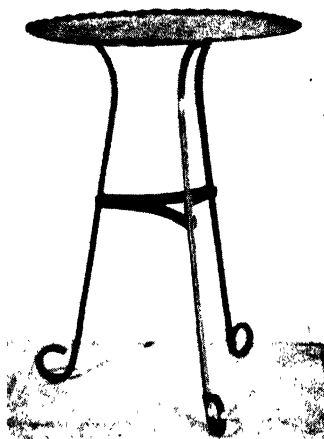
Operations:

1. Draw full-scale layout of pieces.
2. Determine the length of pieces from drawing.
3. Cut pieces to length and file ends square.
4. Bottom ends to be finished with an artistic design.
5. Twist and shape pieces.
6. Locate and drill holes in pieces.
7. Make circle.
8. Locate and drill holes.
9. Fasten pieces together, using soft roundhead rivets.
10. Cut square top from wood.
11. Fasten legs to top, using roundhead wood screws.
12. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

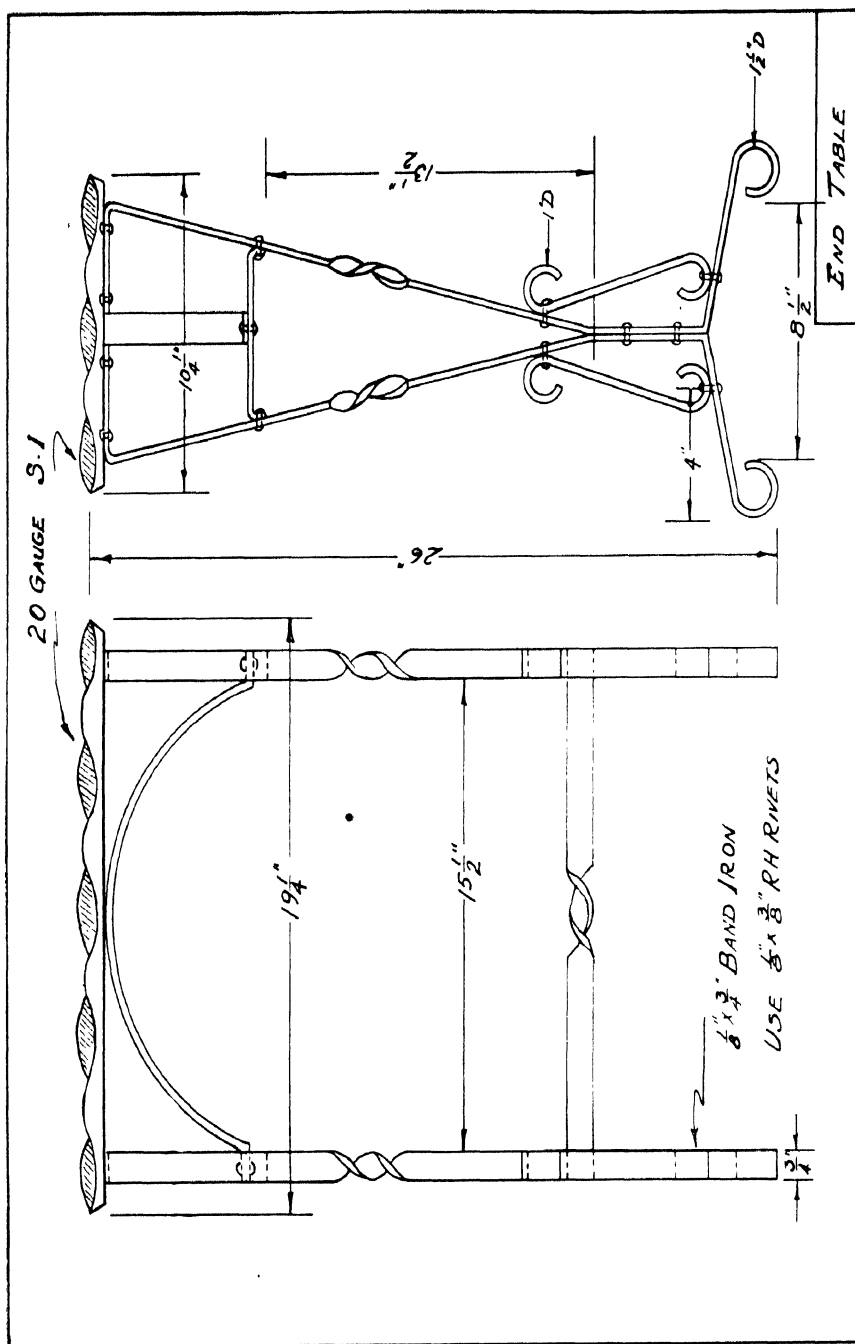


TABLE**Operations:**

1. Draw full-scale layout of pieces.
2. Determine the length of each piece, and cut.
3. File edges evenly.
4. Form ends of the leg pieces.
5. Locate and drill holes.
6. Make stretchers, space the holes, and drill.
7. Rivet legs to the stretchers.
8. Cut metal for top, file edges, and scallop edge as required.
9. Rivet legs to the top.
10. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



END TABLE

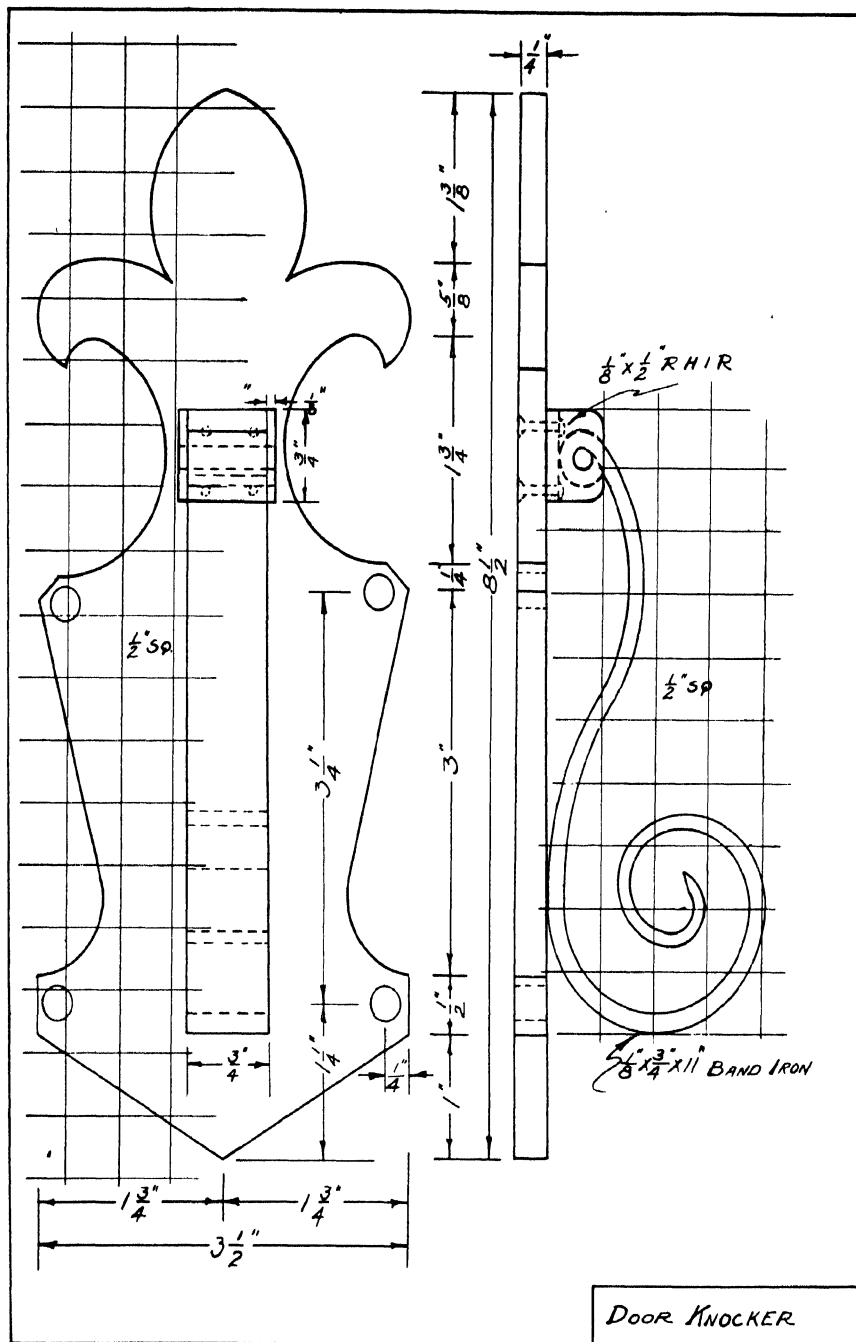


Operations:

1. Draw full-scale layout of pieces.
2. From the drawing, determine the length of each piece.
3. Bend pieces as drawn on paper.
4. Locate and drill holes in the pieces.
5. Cut crosspiece to length, and twist in the center.
6. Drill holes in the ends of the crosspiece.
7. Rivet pieces together.
8. Secure metal for top; file and shape edges as desired.
9. Fasten top to legs and arch.
10. Lacquer table to desired color.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



DOOR KNOCKER

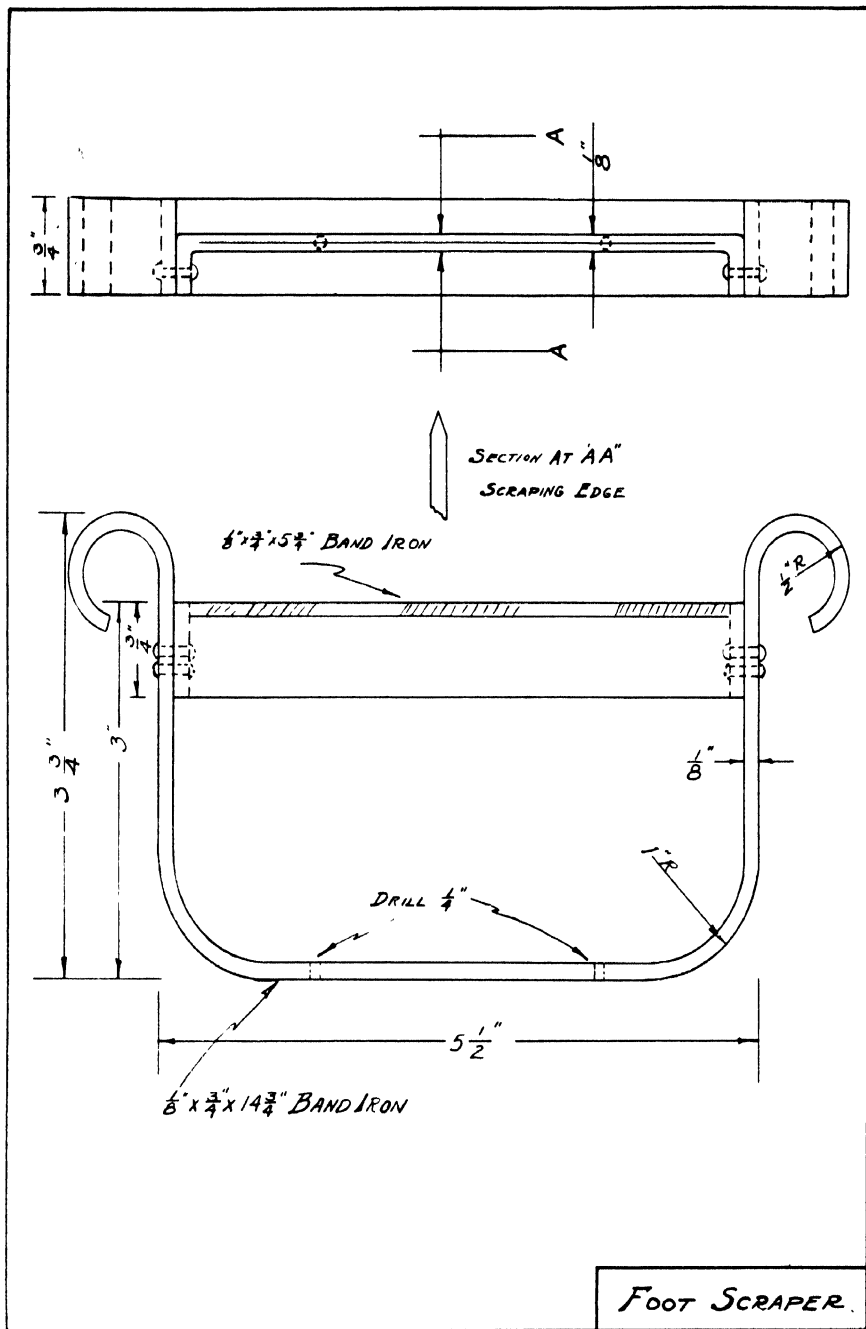


Operations:

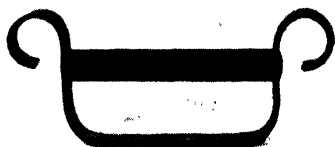
1. Draw full-scale layout of pieces.
2. Trace the design on the iron plate.
3. Form design with drilled holes, hacksaw, and file.
4. Shape and drill the U piece.
5. Rivet U piece to backpiece.
6. Rivet the scroll knocker to U piece.
7. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



FOOT SCRAPER

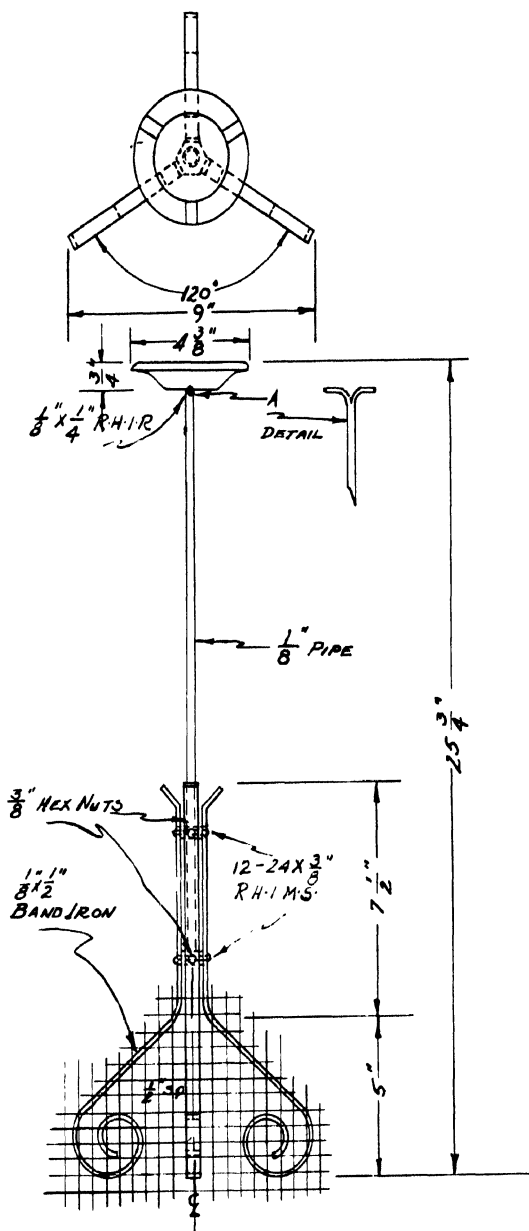


Operations:

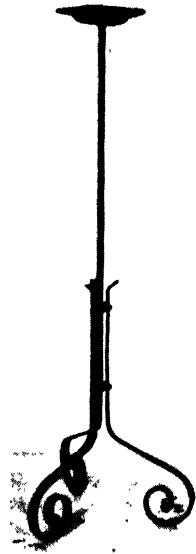
1. Draw full-scale layout of pieces.
2. Cut pieces to length, and file ends square.
3. Shape circle on each end.
4. Cut out the scraper, and bend ends.
5. File the taper on each side of this piece.
6. Lay off the holes, and rivet pieces together.
7. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



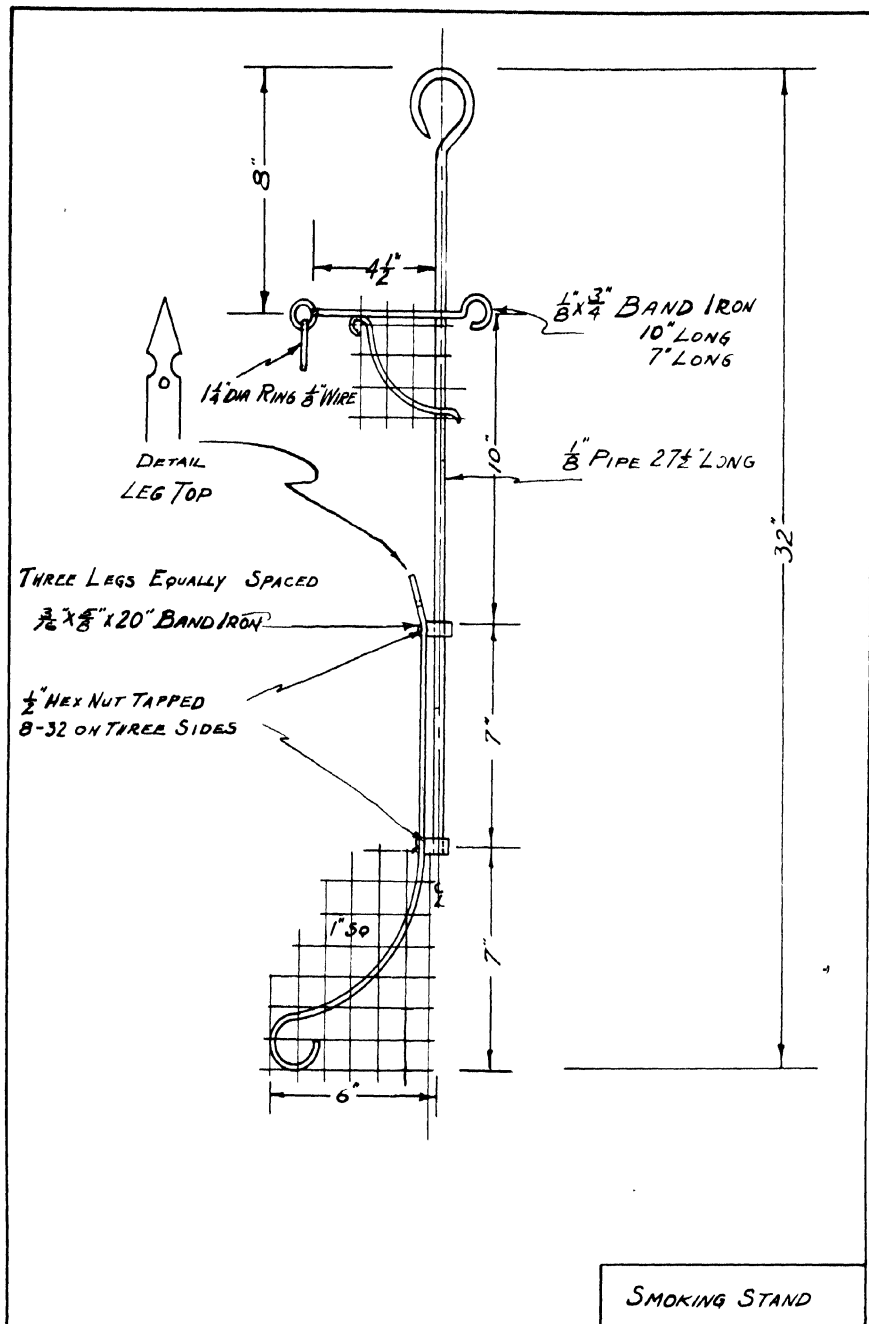
SMOKING STAND

SMOKING STAND*Operations:*

1. Draw full-scale layout of pieces.
2. Determine length of pieces for base, and cut to length.
3. Shape pieces for base.
4. Locate and drill holes in pieces for base.
5. Locate and drill tap holes in hex. nuts for base fastenings.
6. Cut center pipe stem to length.
7. Shape top of pipe for ash tray.
8. Purchase or make ash tray.
9. Assemble pieces.
10. Apply a finish.

Reference:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).



SMOKING STAND

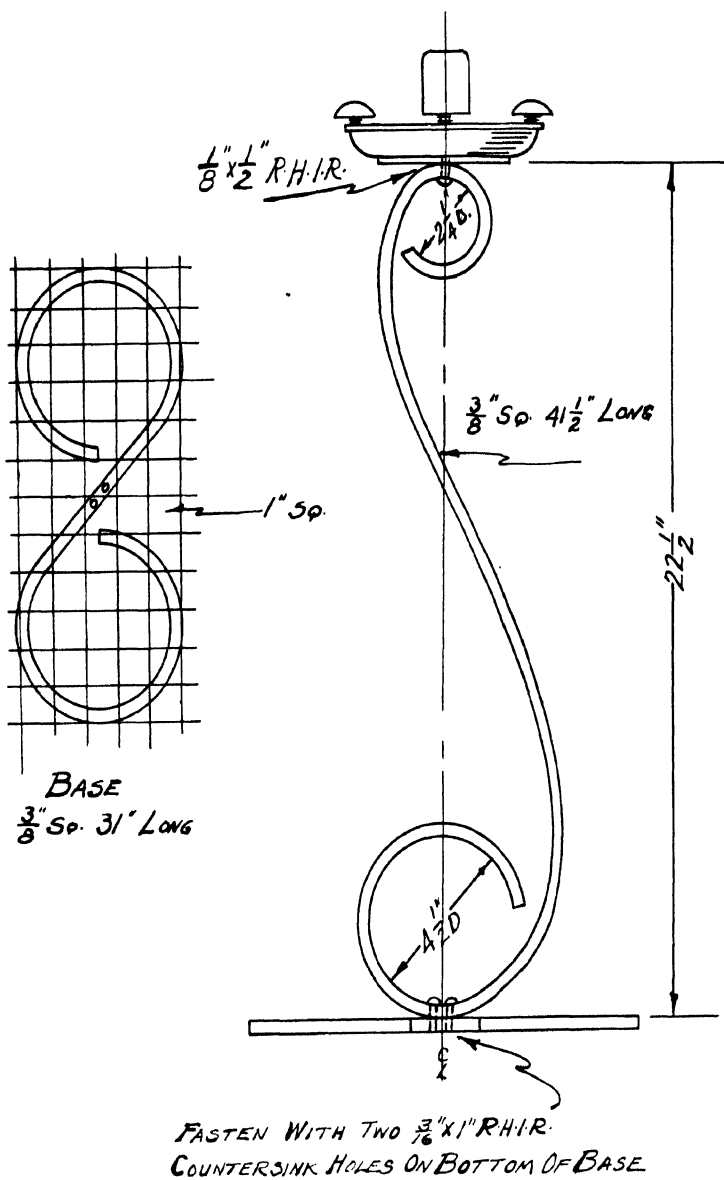


Operations:

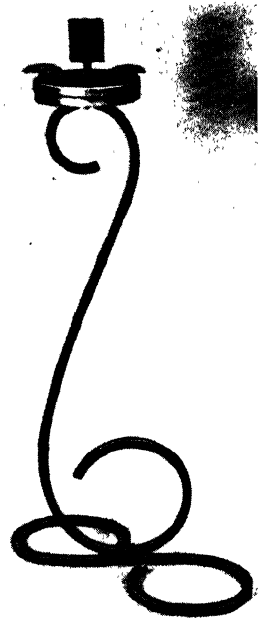
1. Draw full-scale layout of pieces.
2. Determine length of pieces for base.
3. Shape pieces for base.
4. Locate, drill, and tap holes in hex. nuts for base.
5. Determine length of piece for handle.
6. Cut to length, bend, and drill hole in pieces for bracket.
7. Cut, forge, and bend pipe to size.
8. Purchase or make proper ash tray.
9. Assemble pieces.
10. Apply finish.

Reference:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).



SMOKING STAND

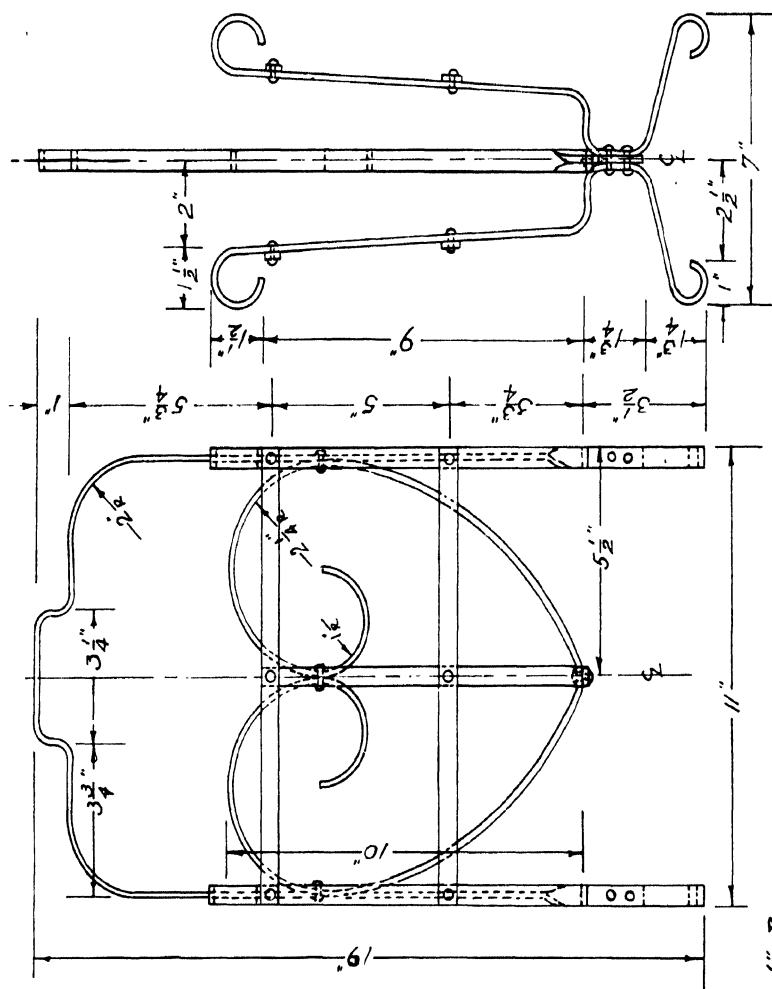
SMOKING STAND*Operations:*

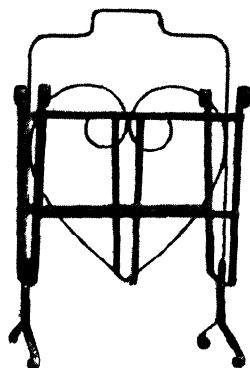
1. Draw full-scale layout of pieces.
2. From the layout, determine the length of each piece.
3. Shape the two scroll ornaments.
4. Locate and drill holes in the pieces.
5. Assemble the stand.
6. Purchase or make ash tray.
7. Apply finish.

Reference:

Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials* (Bruce, Milwaukee).

MAGAZINE RACK

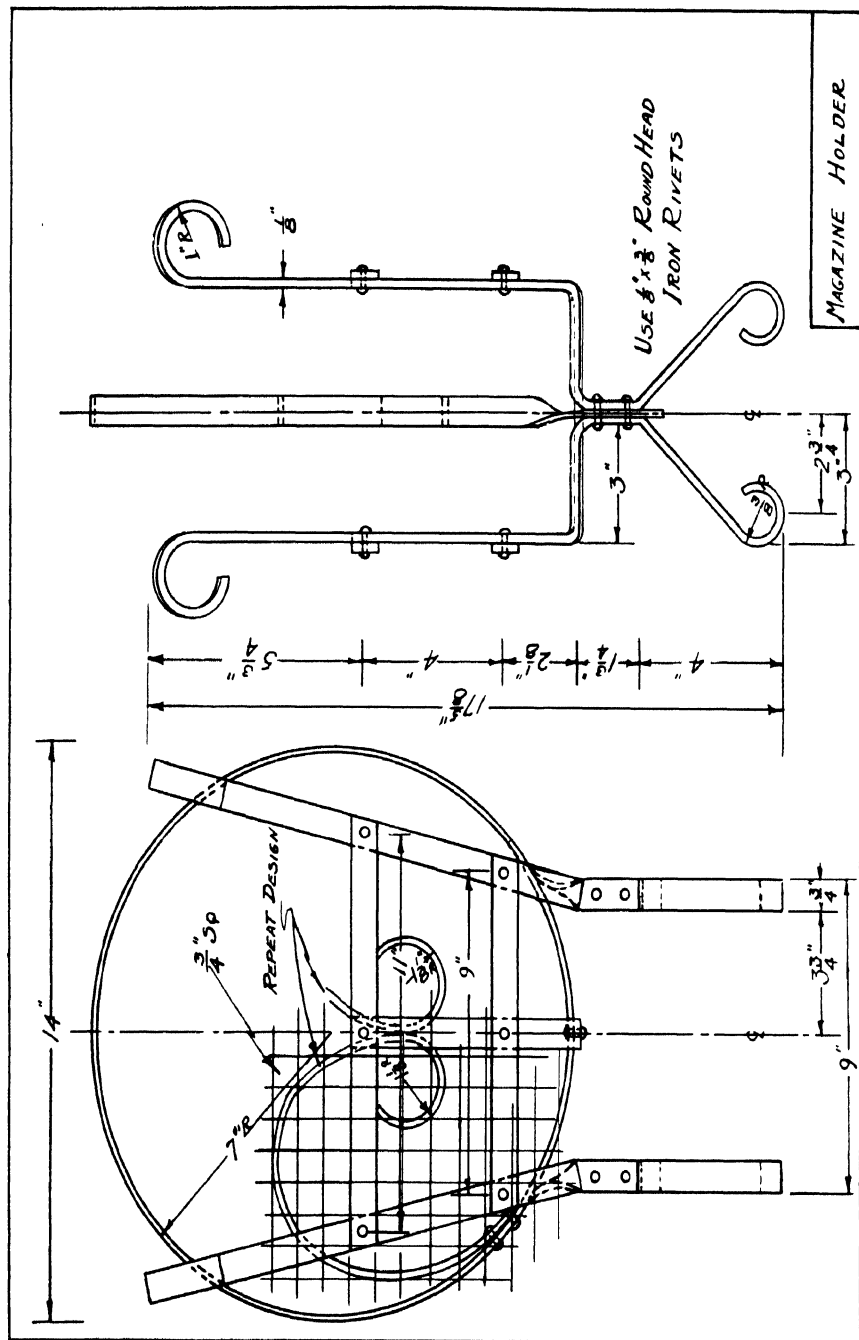


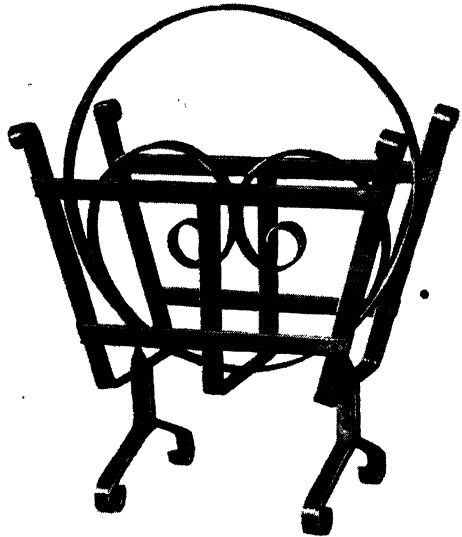
MAGAZINE RACK*Operations:*

1. Draw full-scale layout of pieces.
2. Determine the length of each piece from drawing.
3. Cut pieces to length, and file ends square.
4. Curve the ends of the pieces for the legs.
5. Drill holes.
6. Make the bend in the center of the handle.
7. Make half twist on bottom ends of handle. Drill holes, and rivet handle and the legs together.
8. Make a template for one half of the heart ornament.
9. Curve the iron according to the template.
10. Rivet the ends together and the heart to the handle.
11. Lay out and drill four crosspieces; work from center.
12. Drill holes in the upper parts of the legs, and rivet the crosspieces in place.
13. Bend, drill, and rivet U-shaped piece.
14. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Smith, R. E., *Units in Bench Metal Work* (McCormick-Mathers, Wichita).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials* (Bruce, Milwaukee).



MAGAZINE HOLDER*Operations:*

1. Draw full-scale layout of pieces.
2. Determine the lengths of each piece from drawing.
3. Cut pieces to length, and file ends square.
4. Bend pieces to shape, as determined by full scale drawing.
5. Locate and drill holes in pieces.
6. Rivet pieces together, using roundhead rivets.
7. Finish with lacquer or any color you wish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Smith, R. E., *Units in Bench Metal Work* (McCormick-Mathers, Wichita).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials* (Bruce, Milwaukee).

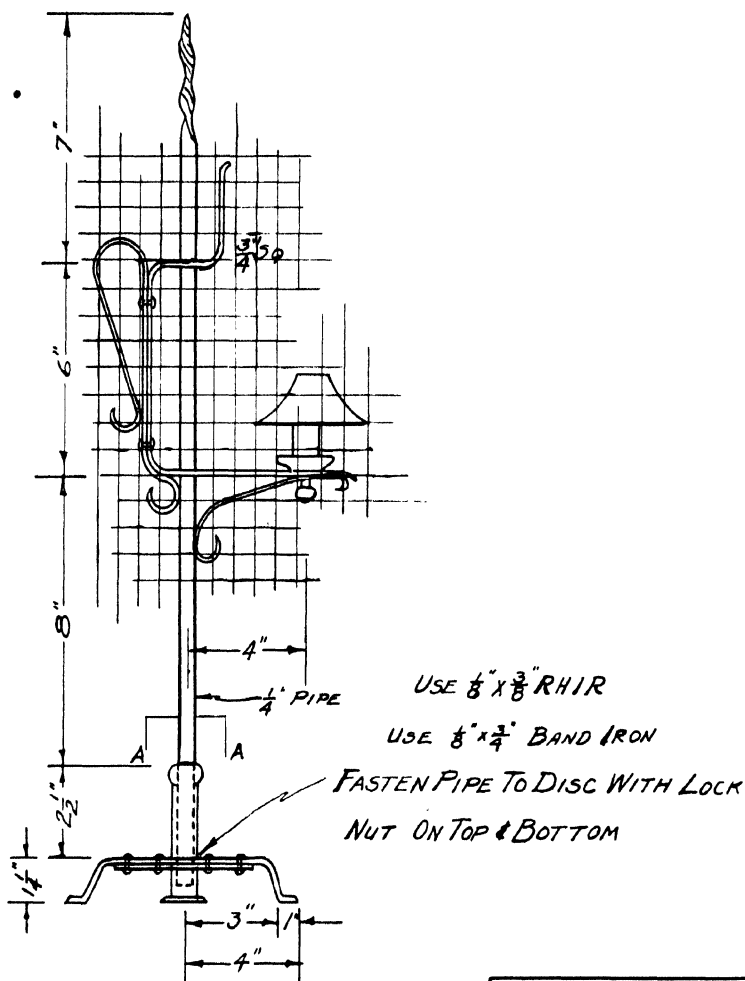
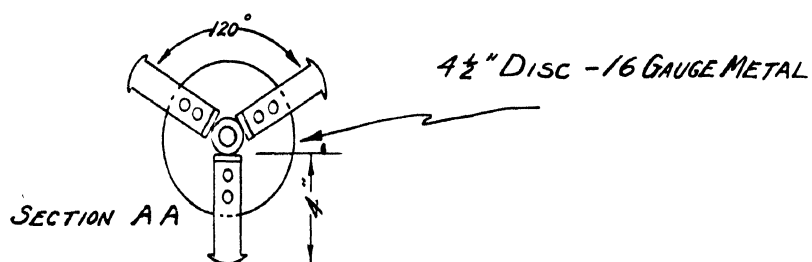
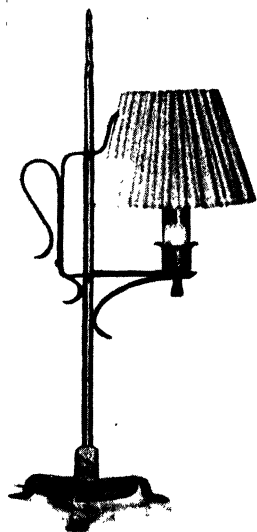


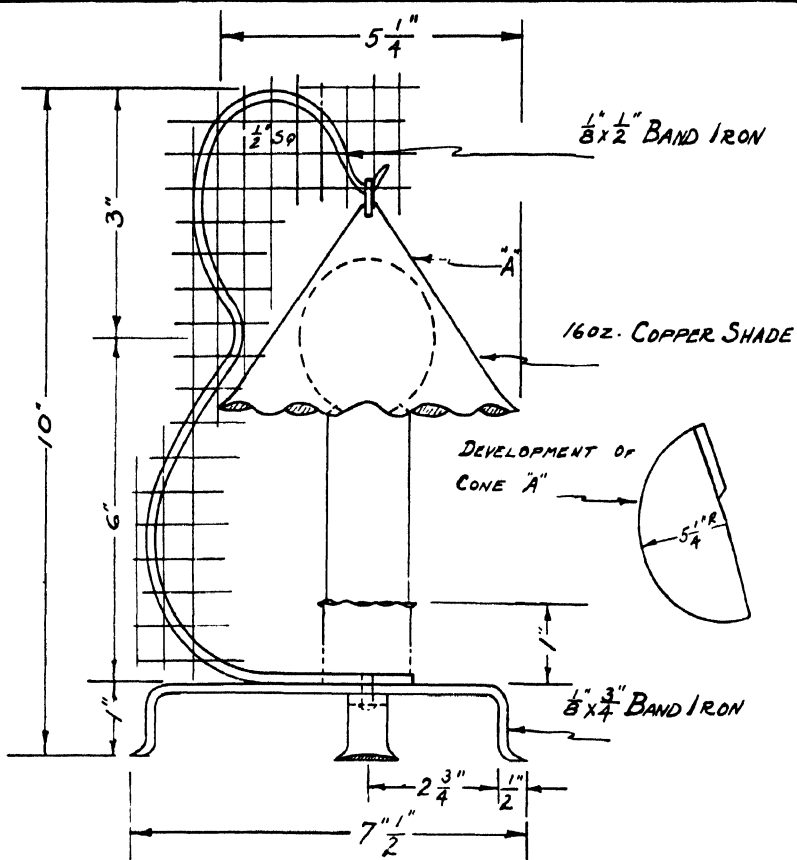
TABLE LAMP

TABLE LAMP*Operations:*

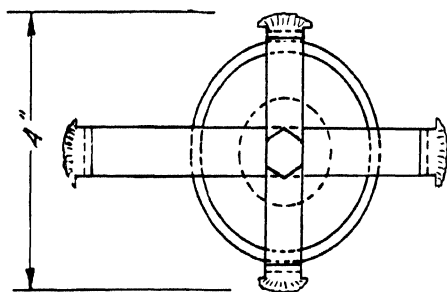
1. Draw full-scale layout of pieces.
2. Determine the length of each piece, and cut.
3. Forge ends and bend feet.
4. Cut 16-gauge disk $4\frac{1}{2}$ in. in diameter.
5. Lay out, drill, and rivet feet to disk.
6. Cut pipe, forge, and twist end.
7. Fasten to base.
8. Bend pieces for lamp bracket.
9. Lay out, drill, and rivet pieces.
10. Obtain lamp base and socket, and fasten together.
11. Connect wire and base plug.
12. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

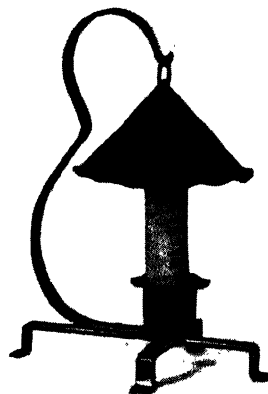


DEVELOPMENT OF
CONE "A"



RADIO LAMP

RADIO LAMP



Operations:

1. Draw full-scale layout of pieces.
2. From drawing, determine the length of each piece.
3. Cut pieces to length, file ends evenly, and flare.
4. Bend pieces to shape as drawn on paper.
5. Locate and drill holes in pieces.
6. Make copper shade and ring.
7. Rivet pieces together.
8. Obtain socket and wire.
9. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

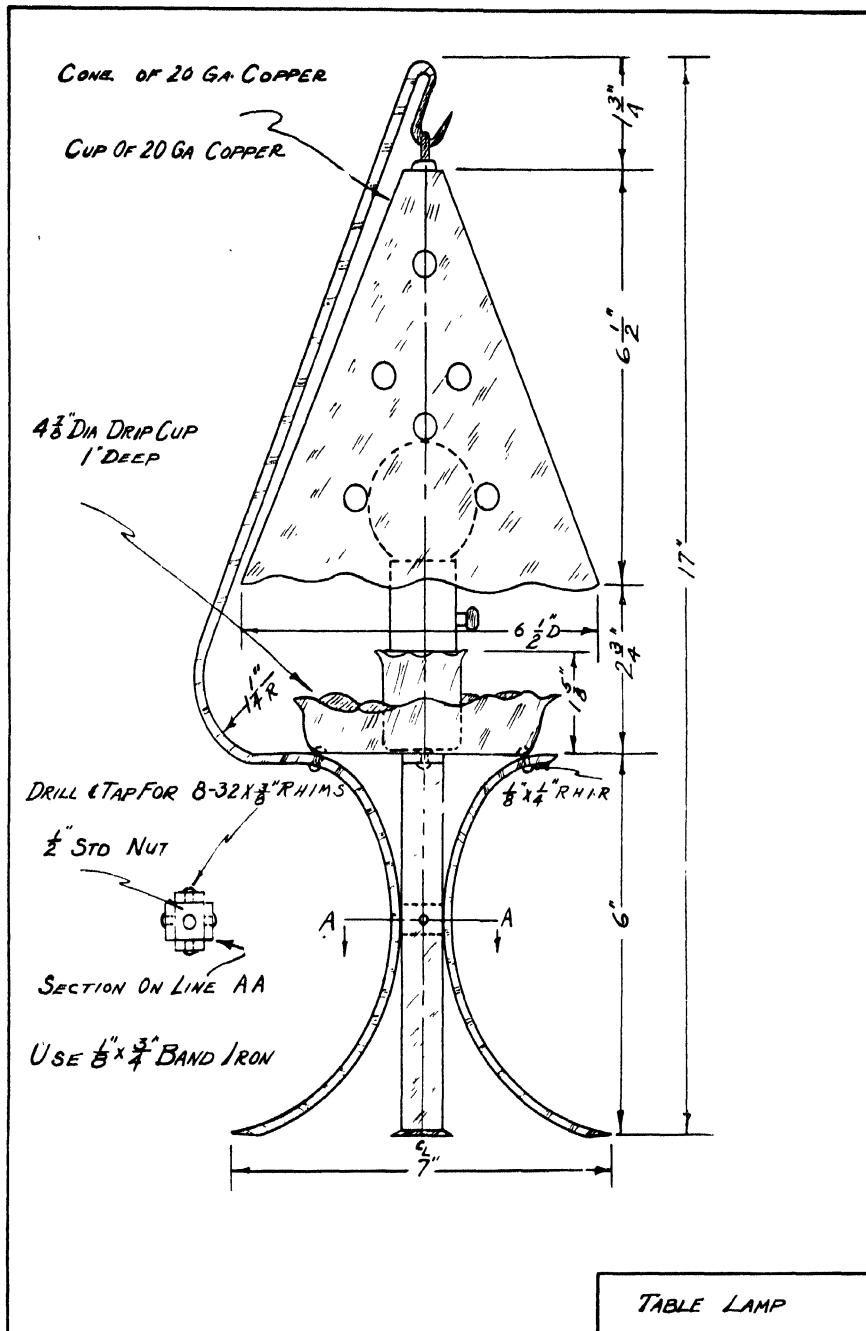
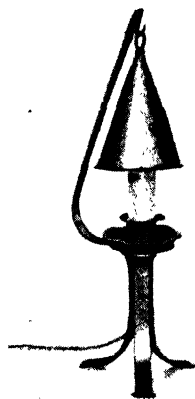


TABLE LAMP

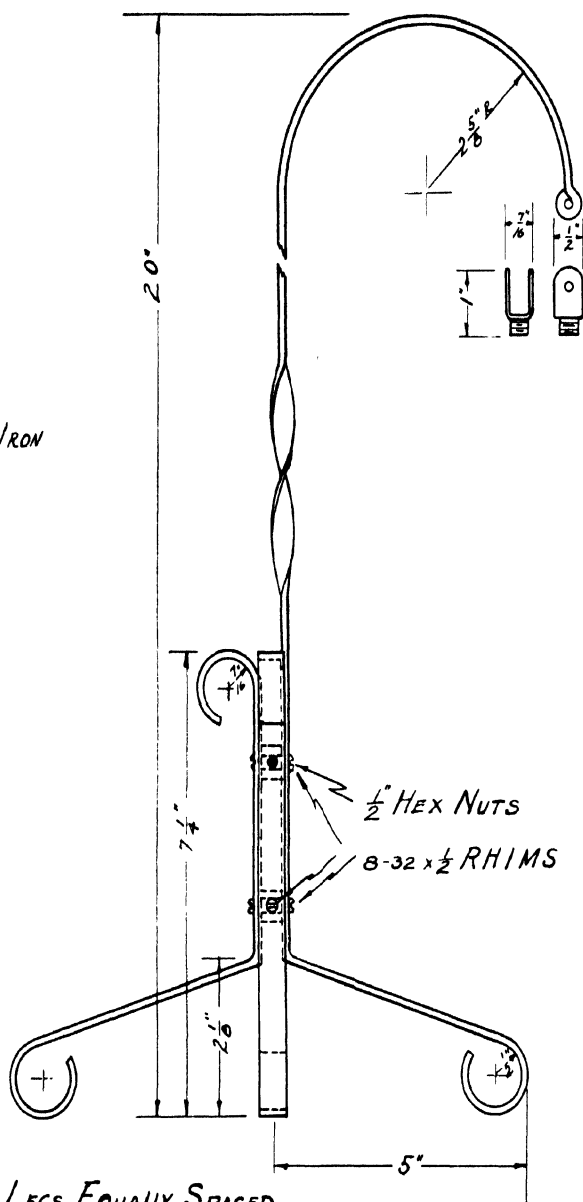
TABLE LAMP*Operations:*

1. Determine the length of each piece, and cut.
2. Shape pieces as shown.
3. Locate holes, and drill.
4. Drill and tap holes in Standard square nut.
5. Purchase or make socket holder.
6. Fasten to fixture, and connect wire to socket.
7. Make copper shade.
8. Apply finish.

References:

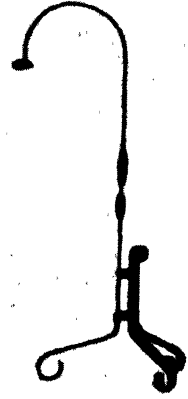
- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

$\frac{1}{8} \times \frac{1}{2}$ BAND IRON



RADIO LAMP

RADIO LAMP



Operations:

1. Make full-size layout of pieces for base and top of lamp.
2. From drawing, determine the length of each piece.
3. Cut pieces, and file ends square. Bend pieces as shown.
4. Mark off portion to be twisted, and twist.
5. Locate and drill holes in pieces for base.
6. Drill and tap holes in hex. nuts.
7. Assemble pieces.
8. Make U-shaped piece, and fasten with screw and wing nut.
9. Run wire, fasten top fixture, and connect wire to socket.
10. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

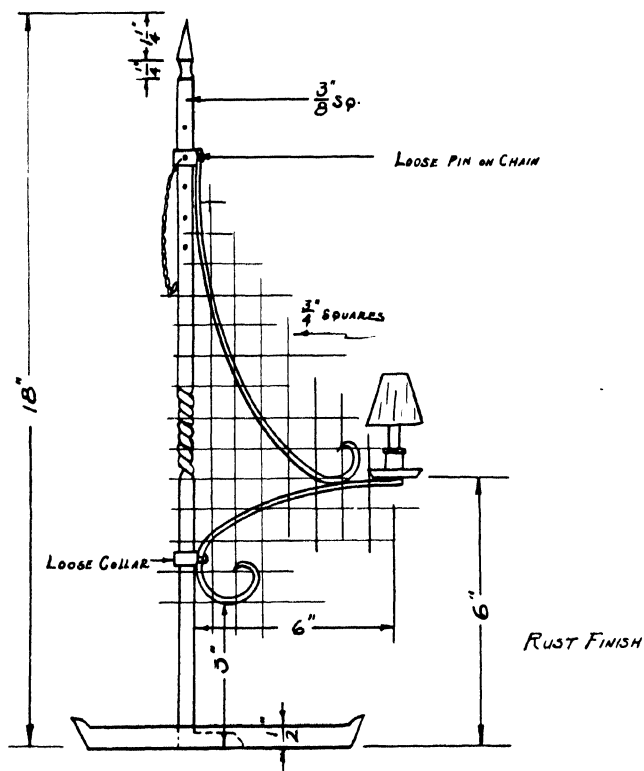
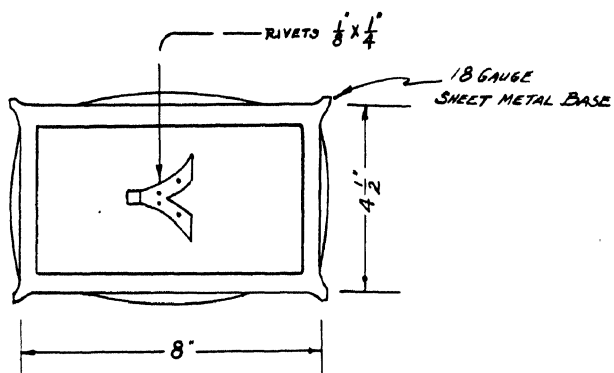
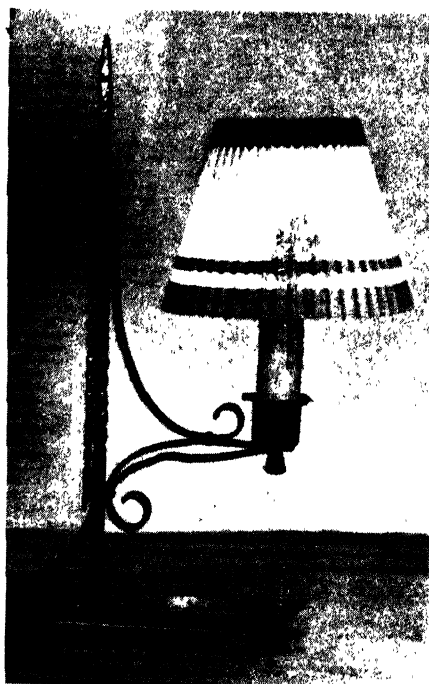


TABLE LAMP

TABLE LAMP



Operations:

1. Cut metal for tray. File edges smooth.
2. Scribe layout on metal.
3. Hammer sides to shape.
4. Polish with steel wool.
5. Draw full-scale design of pieces on cross-section paper.
6. Determine the length of each piece, and cut.
7. Shape pieces.
8. Locate and drill holes.
9. Mark off portion of post to be twisted, and twist.
10. Drill holes, and fit loose collars.
11. Fasten sidepieces and chain.
12. Rivet lamp to base.
13. Select socket.
14. Fasten fixture, and connect wire.
15. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

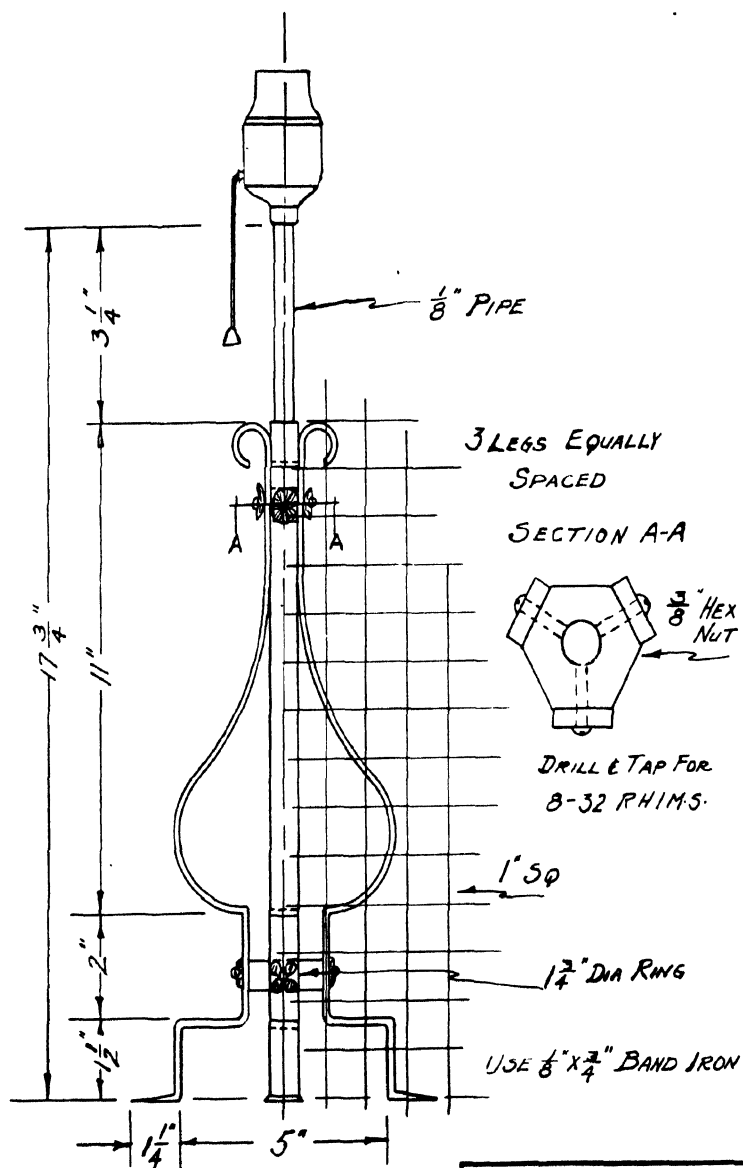
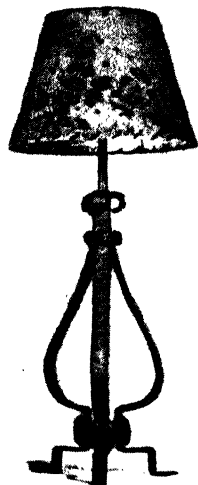


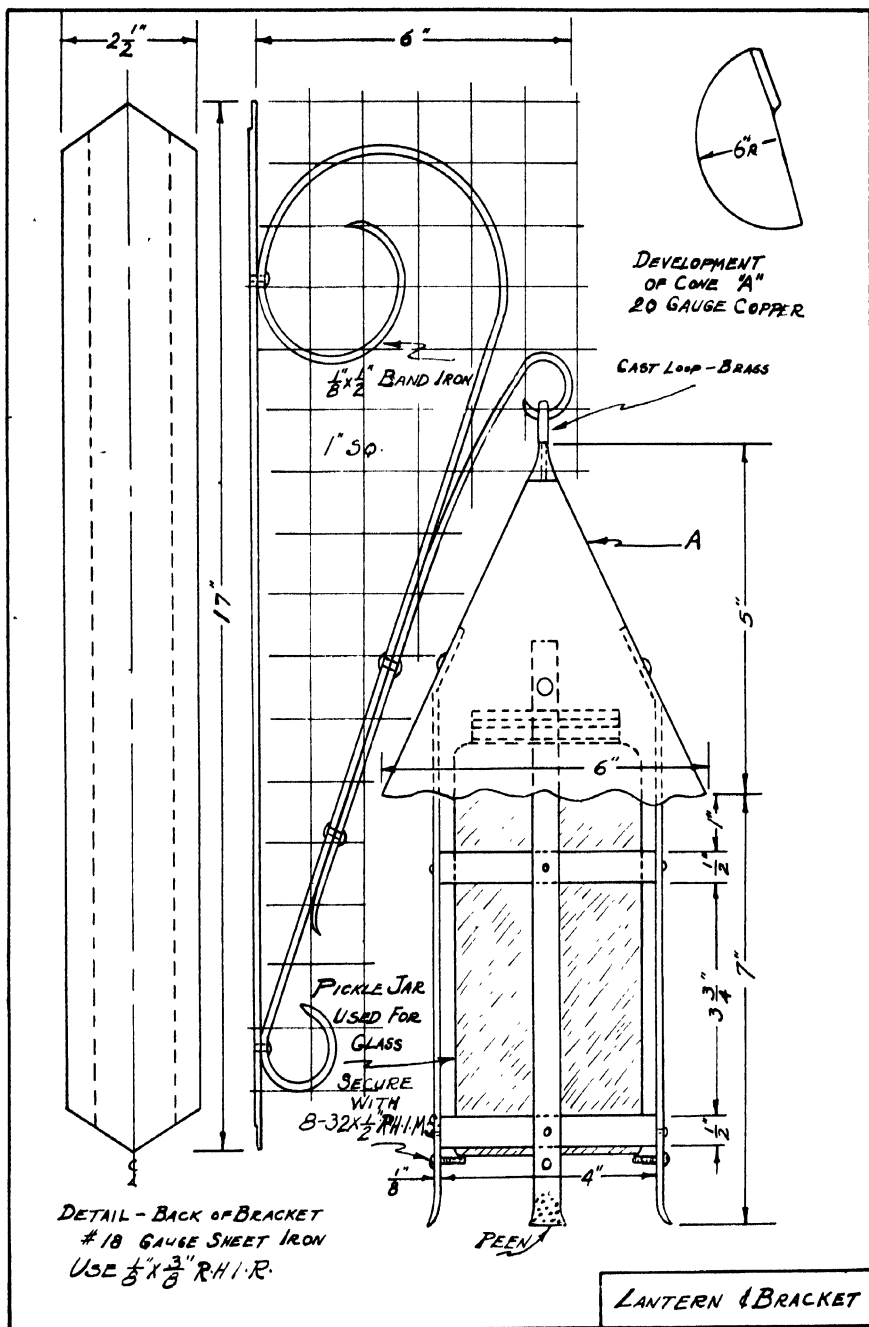
TABLE LAMP

TABLE LAMP*Operations:*

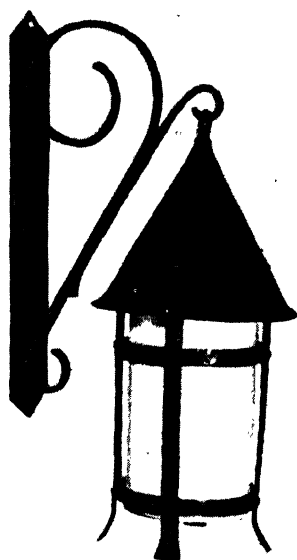
1. Draw full-scale layout of pieces.
2. Determine the length of each piece.
3. Cut pieces to length, and file ends square.
4. All ends are to be finished with an artistic design.
5. Locate, drill, and tap holes in hex. nut for $\frac{1}{8}$ -in. pipe.
6. Shape sidepieces.
7. Locate and drill holes on sidepieces.
8. Drill holes in pipe.
9. Thread the top end of pipe.
10. Form $1\frac{1}{4}$ -in. circular ring for bottom fastening.
11. Fasten sidepieces to bottom and top.
12. Run wire through pipe, fasten top fixture, and connect wire to socket.
13. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



LANTERN AND BRACKET



Operations:

1. Draw full-scale layout for bracket.
2. Determine the length of each piece from the layout.
3. Cut pieces to length.
4. Square the ends.
5. Bend pieces.
6. Locate, drill holes, and rivet.
7. Cut sheet metal for back plate to size.
8. File edges evenly, and fold.
9. Locate holes, drill, and rivet to bracket arm.
10. Cut band iron for lantern.
11. Form rings, bend, and flare vertical strips.
12. Locate, drill holes, and rivet.
13. Develop cone for lantern.
14. Locate, drill holes, and rivet cone.
15. Scallop lower edge of cone.
16. Solder fixture loop to top of cone.
17. Fasten fixture, run wire through, and connect wire to socket.
18. Select glass jar or mica housing.
19. Apply finish.

References:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

COLONIAL BRIDGE LAMP

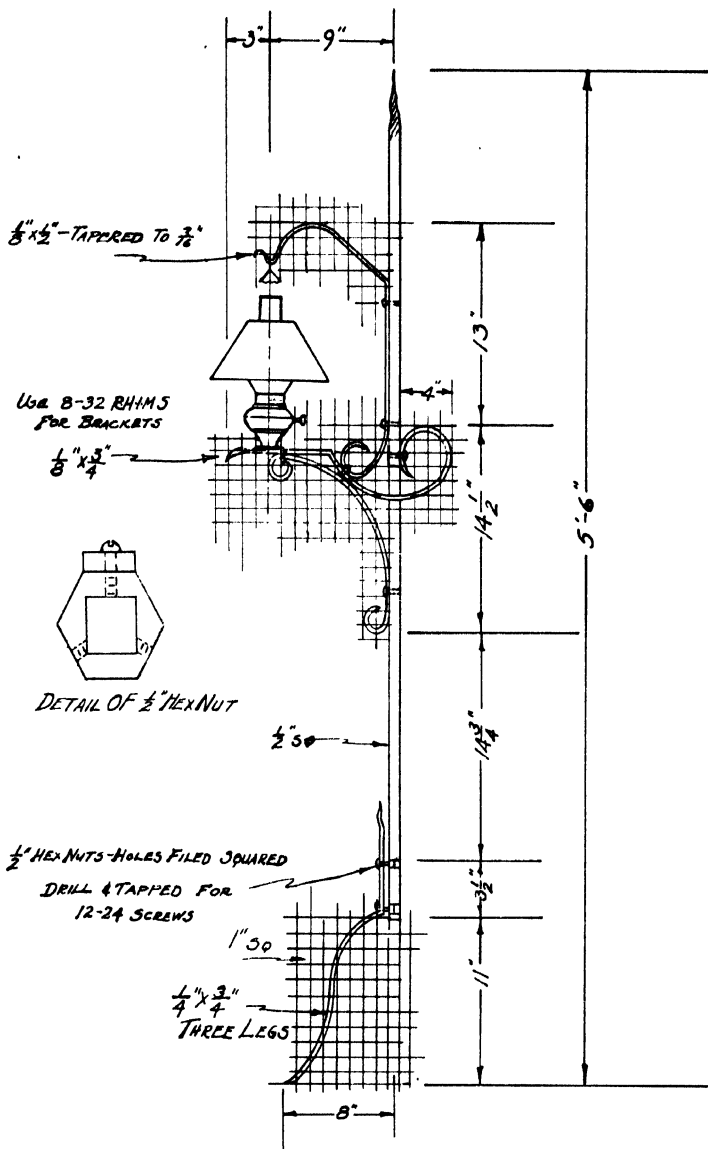


Operations:

1. Make full-size layout of pieces for base and bracket.
2. From drawing, determine the length of each piece.
3. Cut pieces, and file or peen ends to artistic design.
4. Shape pieces for base and bracket.
5. Locate and drill holes in pieces for base and bracket.
6. Drill and tap holes in hex. nuts for base.
7. Cut pipes to length, forge, and twist end of $\frac{3}{8}$ -in. pipe.
8. Locate and drill holes in pipe.
9. Shape leg head to spear point.
10. Make chimney shade, using 20-gauge brass or copper.
11. Purchase a colonial socket holder, and fasten to bracket.
12. Attach wire, and connect to socket.
13. Apply finish.

References:

- Smith, R. E., *Units in Bench Metal Work* (McCormick-Mathers, Wichita).
- Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials* (Bruce, Milwaukee).



COLONIAL BRIDGE LAMP

COLONIAL BRIDGE LAMP

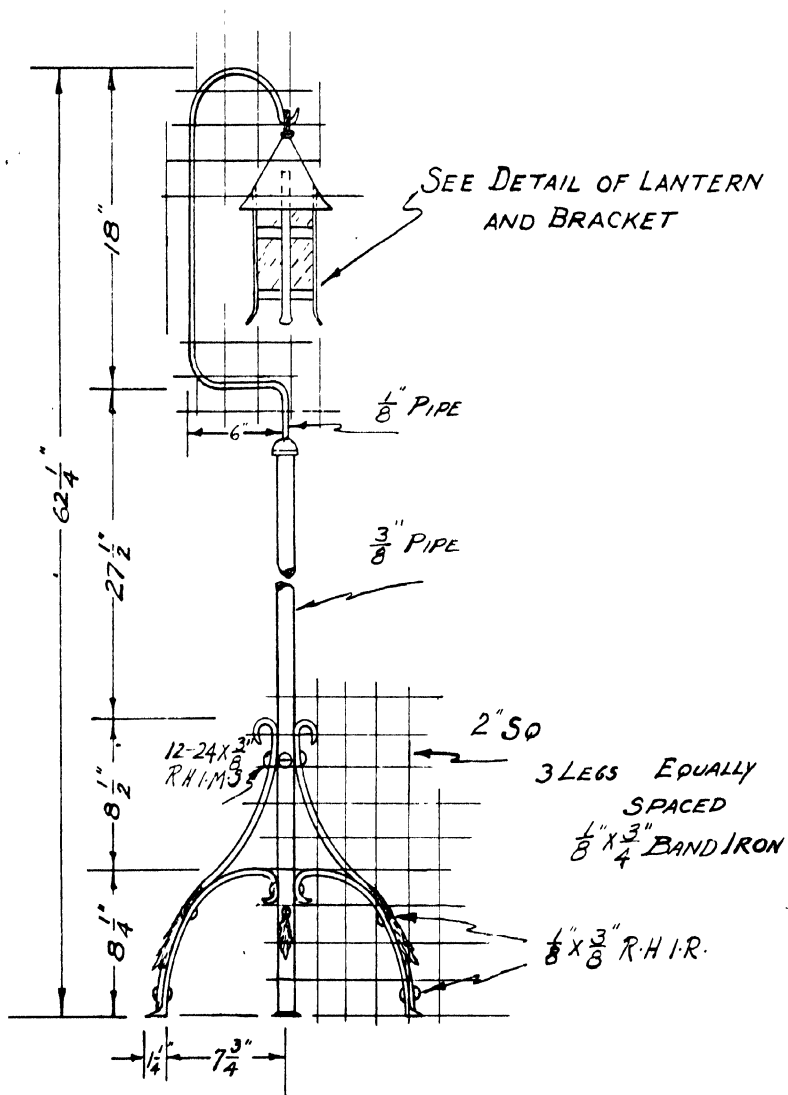


Operations:

1. Make full-size layout of pieces for base, bracket, and shade holder.
2. From drawing, determine the length of each piece.
3. Cut pieces, and file ends artistically.
4. Shape pieces for base, bracket, and shade holder.
5. Locate and drill holes in pieces for base, bracket, and shade holder.
6. Drill and tap holes in hex. nuts for base.
7. Cut square post to length.
8. Twist head.
9. Locate, drill, and tap holes.
10. Make chimney shade. Use 20-gauge copper or brass.
11. Purchase a colonial socket holder, and fasten.
12. Attach wire, and connect socket.
13. Apply finish.

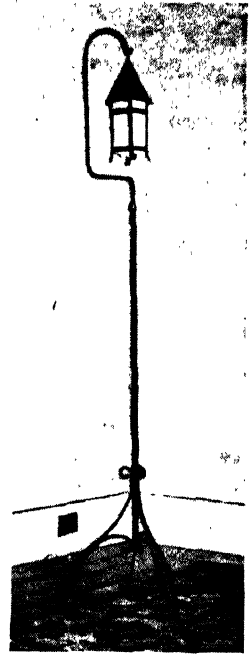
References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Smith, R. E., *Units in Bench Metal Work* (McCormick-Mathers, Wichita).



FLOOR LAMP

FLOOR LAMP

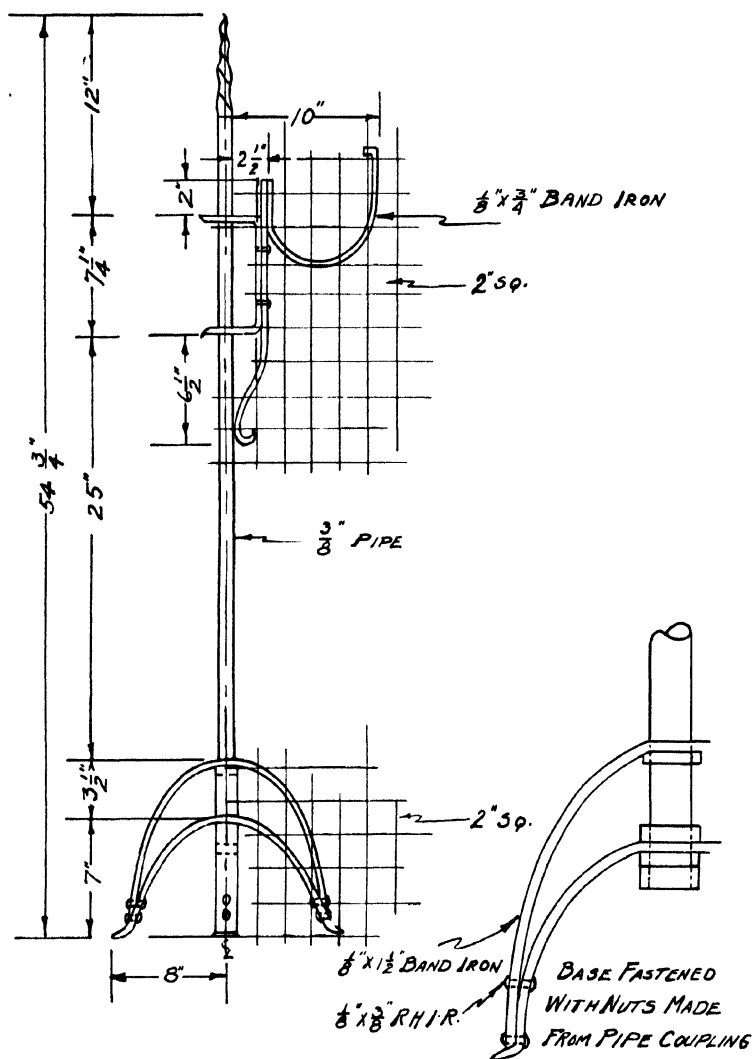


Operations:

1. Make full-size layout of pieces for base and top of lamp hanger.
2. From drawing, determine the length of each piece.
3. Cut pieces, and file ends to artistic design.
4. Shape pieces for base, and rivet together.
5. Locate and drill holes in pieces for base.
6. Cut $\frac{1}{8}$ -in. pipe to length.
7. Shape $\frac{1}{8}$ -in. pipe for lamp hanger.
8. Cut $\frac{3}{8}$ -in. pipe to length.
9. Assemble base and top.
10. Make lantern design, and cut top from copper.
11. Run wire through, and connect to socket.
12. Apply finish.

References:

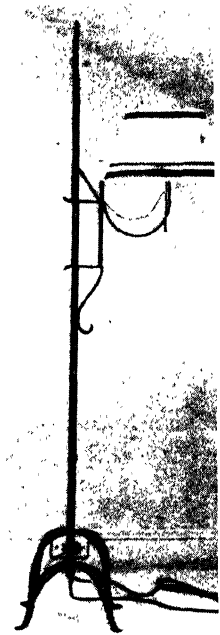
- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Smith, R. E., *Units in Bench Metal Work* (McCormick-Mathers, Wichita).



DETAIL

FLOOR LAMP

FLOOR LAMP

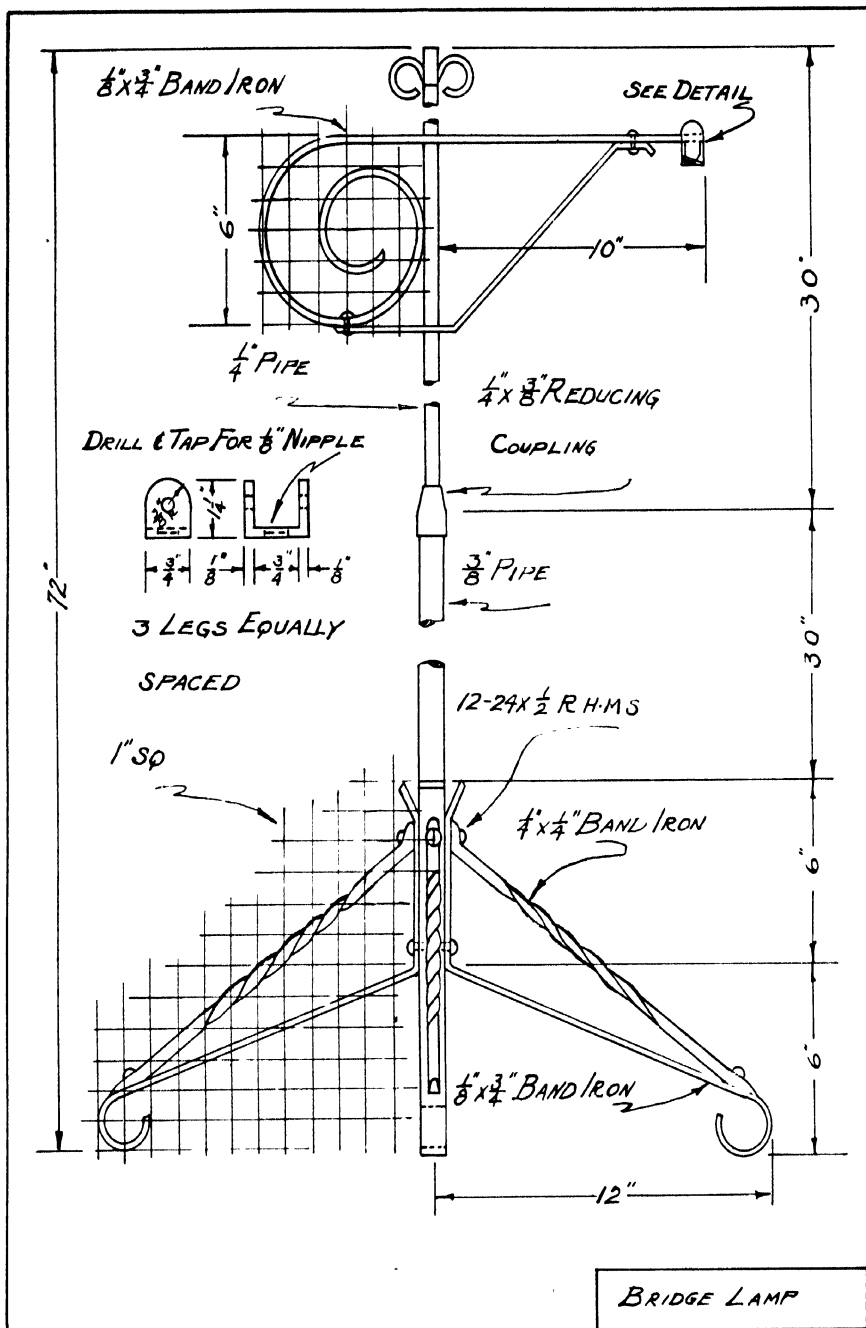


Operations:

1. Make full-size layout of pieces for base and top of lamp.
2. From drawing, determine the length of each piece.
3. Cut pieces, and file ends artistically.
4. Bend pieces for base and lamp bracket, then assemble.
5. Locate and drill holes in pieces for base and top.
6. Cut $\frac{3}{8}$ -in. pipe to length, and twist top.
7. Fasten base and top assembly to pipe.
8. Run wire, and connect to socket.
9. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



BRIDGE LAMP

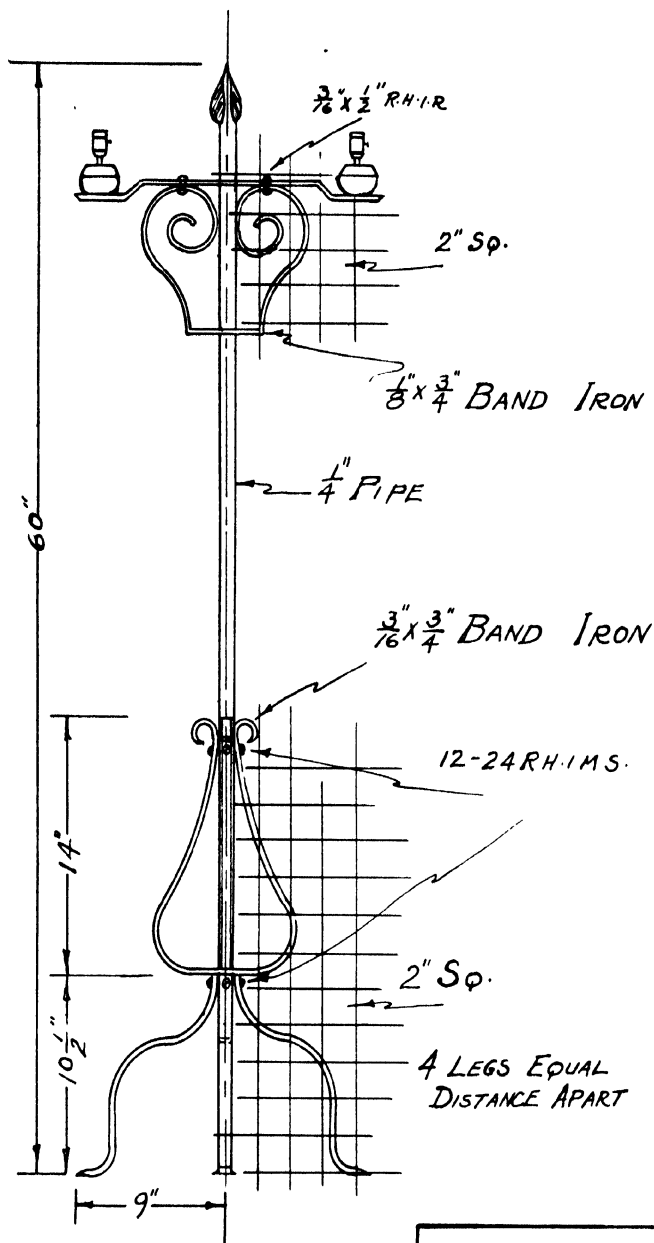


Operations:

1. Draw full-scale layout of pieces for base and arm of lamp.
2. Determine the length of each piece from the drawing.
3. Cut pieces, and file ends square.
4. Finish all ends with artistic design.
5. Shape pieces for base.
6. Shape pieces for top.
7. Locate and drill holes in pieces for base and top.
8. Rivet pieces together.
9. Cut pipes to length.
10. Select a reducing coupling.
11. Locate, drill, and tap holes in pipe.
12. Fasten base and top to pipe.
13. Make socket holder, fasten with bolt and wing nut.
14. Shape design on top of pipe.
15. Run wire through pipe, and connect to socket.
16. Apply finish.

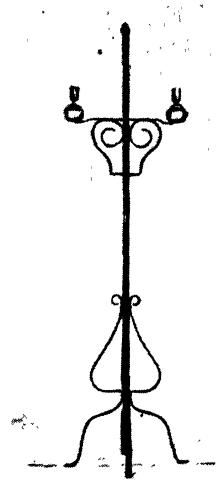
References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials* (Bruce, Milwaukee).



FLOOR LAMP

FLOOR LAMP

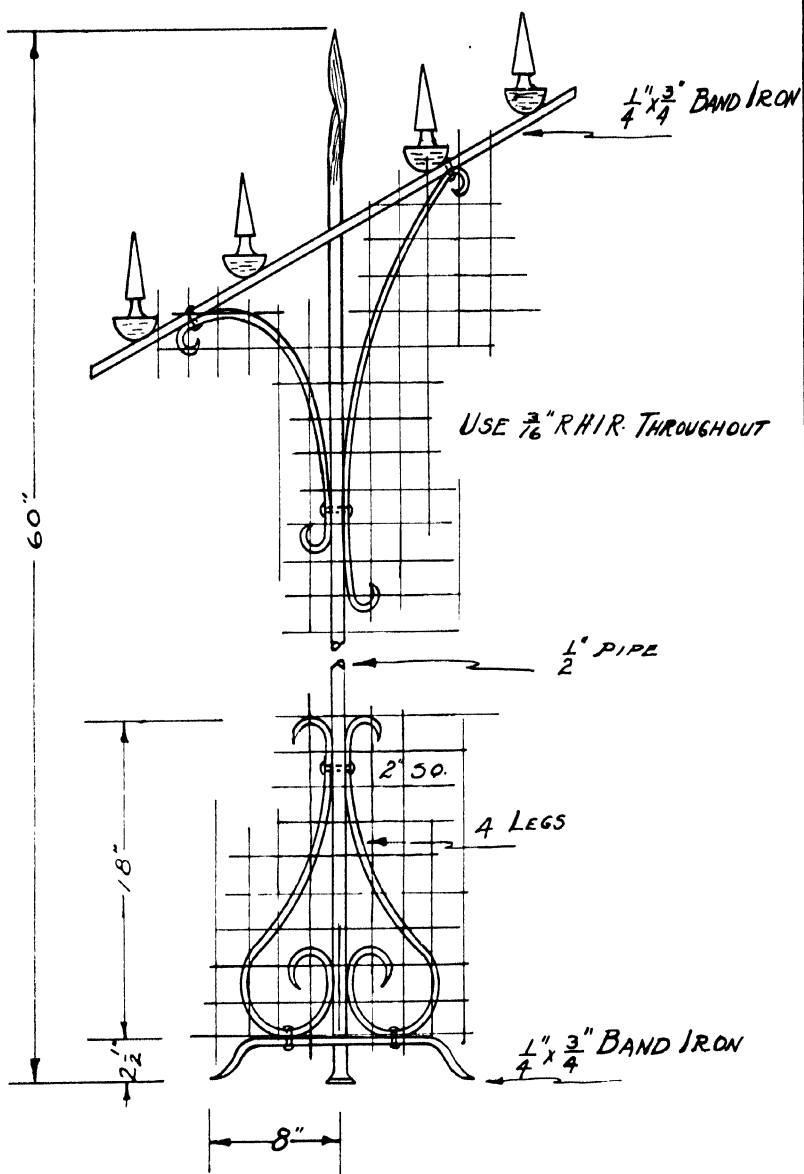


Operations:

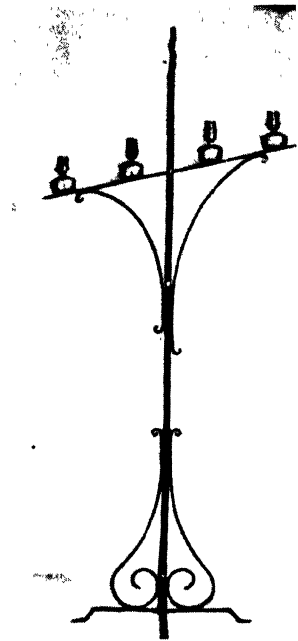
1. Draw full-scale design of legs and lamp holder.
2. Determine the length of pieces from drawing.
3. Cut pieces to length.
4. Shape legs and pieces for lamp bracket.
5. Locate and drill holes in pieces.
6. Twist top of pipe.
7. Cut pipe to length, locate holes, drill, and tap.
8. Rivet lamp bracket.
9. Assemble base, fasten with 12/24 roundhead machine screws.
10. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



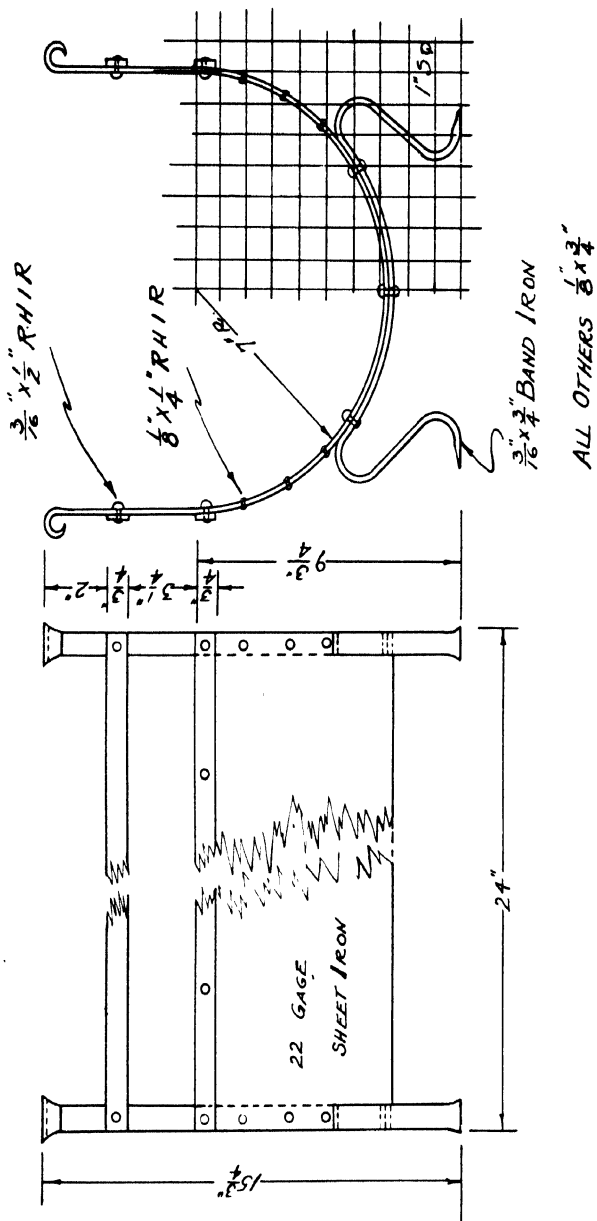
TORCHÈRE

TORCHERE*Operations:*

1. Draw full-scale design of legs and candleholder.
2. Cut pieces to length.
3. Shape legs and toppieces.
4. Locate and drill holes in pieces.
5. Cut pipe to length, locate holes, and drill.
6. Twist top of pipe.
7. Assemble parts.
8. Apply finish.

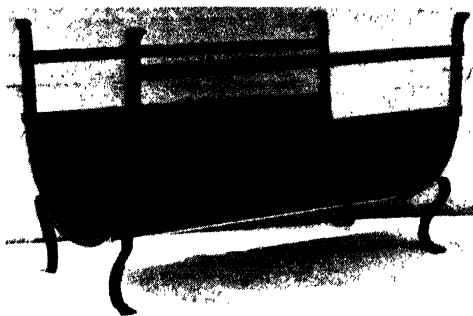
References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



WOOD BASKET

WOOD BASKET

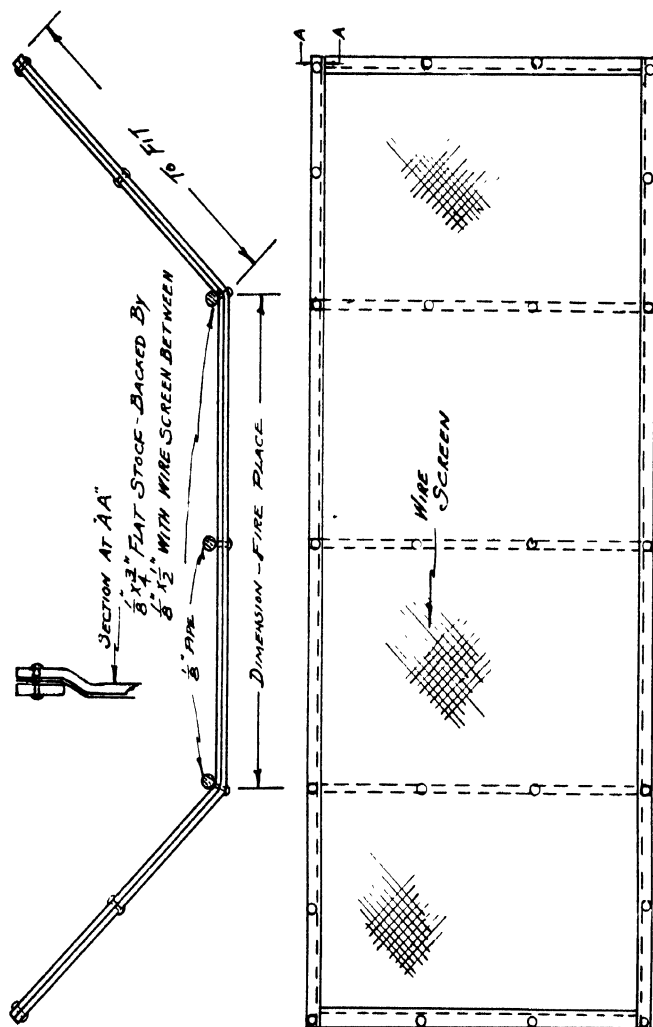


Operations:

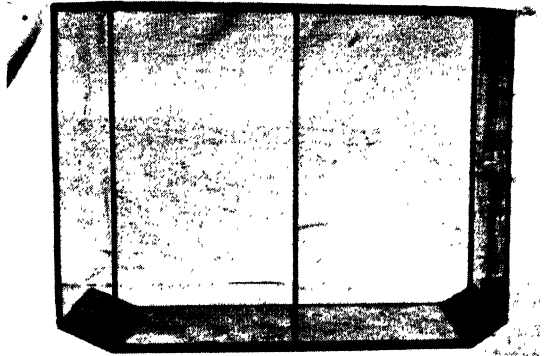
1. Cut a piece of 22-gauge sheet iron.
2. Smooth the edges with a file.
3. Draw full-scale layout of legs.
4. Bend legs and endpieces.
5. Locate and drill holes.
6. Cut four side strips.
7. Locate and drill holes.
8. Assemble pieces, and rivet.
9. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Smith, R. E., *Units in Bench Metal Work* (McCormick-Mathers, Wichita).



FIRE PLACE SCREEN

FIREPLACE SCREEN

The size of this project is determined by the size of the fireplace with which it is to be used.

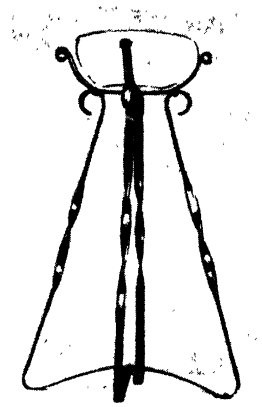
Operations:

1. Determine the length of each piece, and cut.
2. File ends square.
3. Purchase screening, and cut to size.
4. Bend pieces as required.
5. Clamp screen to frame.
6. Lay out holes, drill, and rivet.
7. Apply finish.

References:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

JARDINIERE



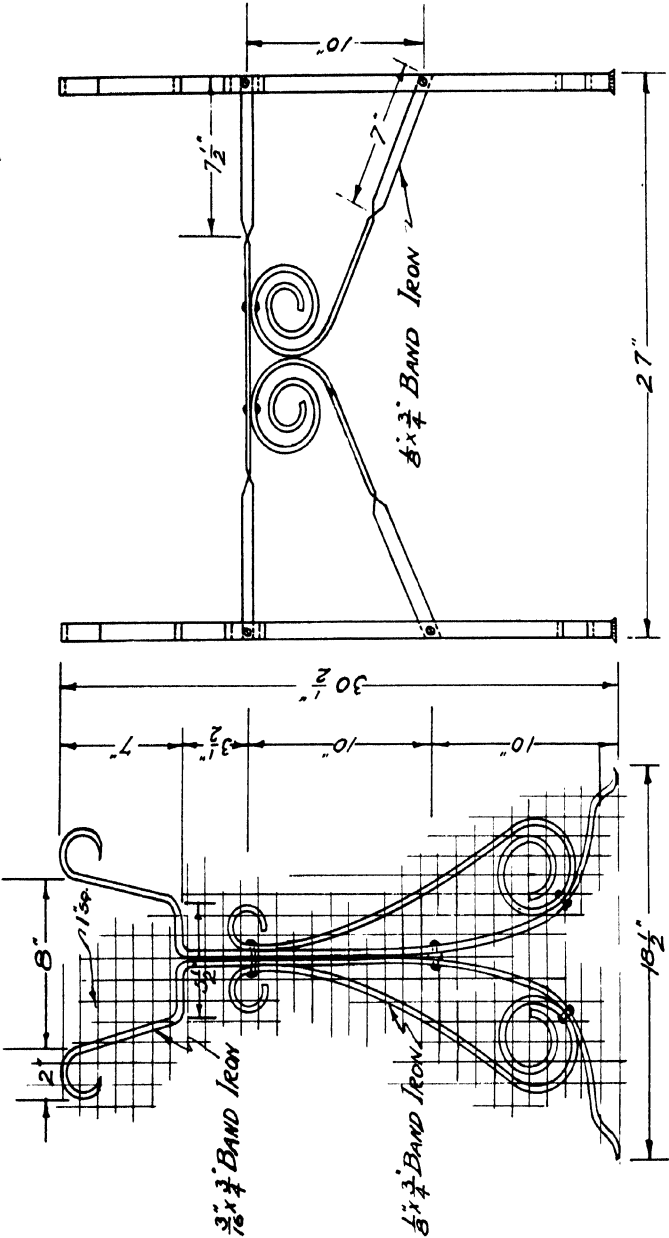
Operations:

1. Draw full-scale layout of pieces.
2. Determine the length of each piece, and cut.
3. File ends square.
4. Locate and drill holes.
5. Shape pieces as required.
6. Mark off portions to be twisted, and twist.
7. Rivet pieces together.
8. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

FERNERY

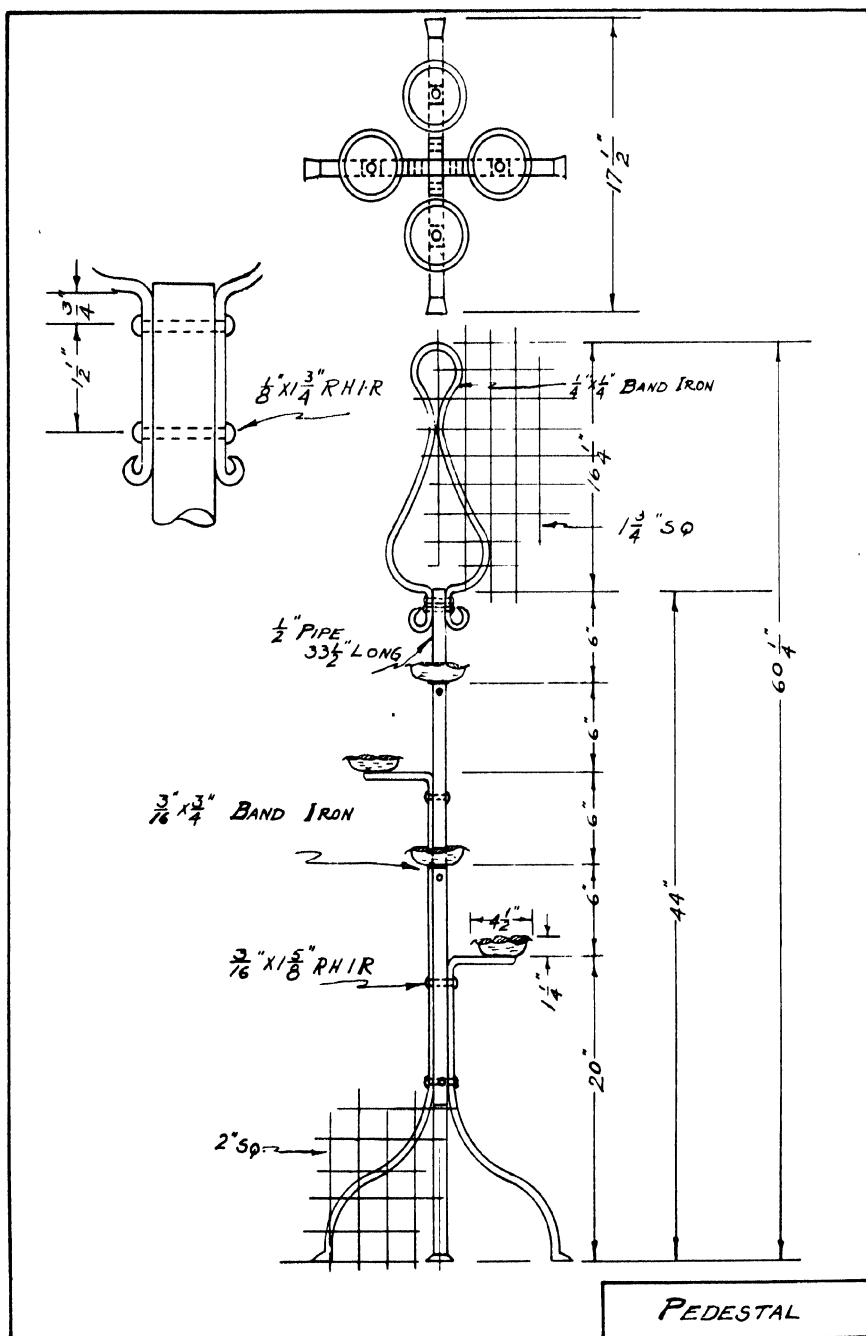


FERNERY*Operations:*

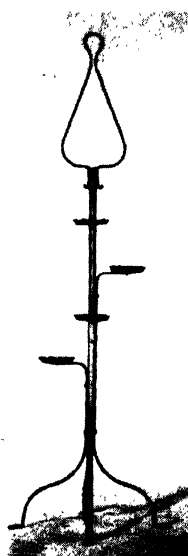
1. Lay out full size, determine the length of each piece, and cut.
2. File ends artistically.
3. Shape pieces as required.
4. Locate and drill holes.
5. Rivet pieces together.
6. Apply finish.

References:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



PEDESTAL

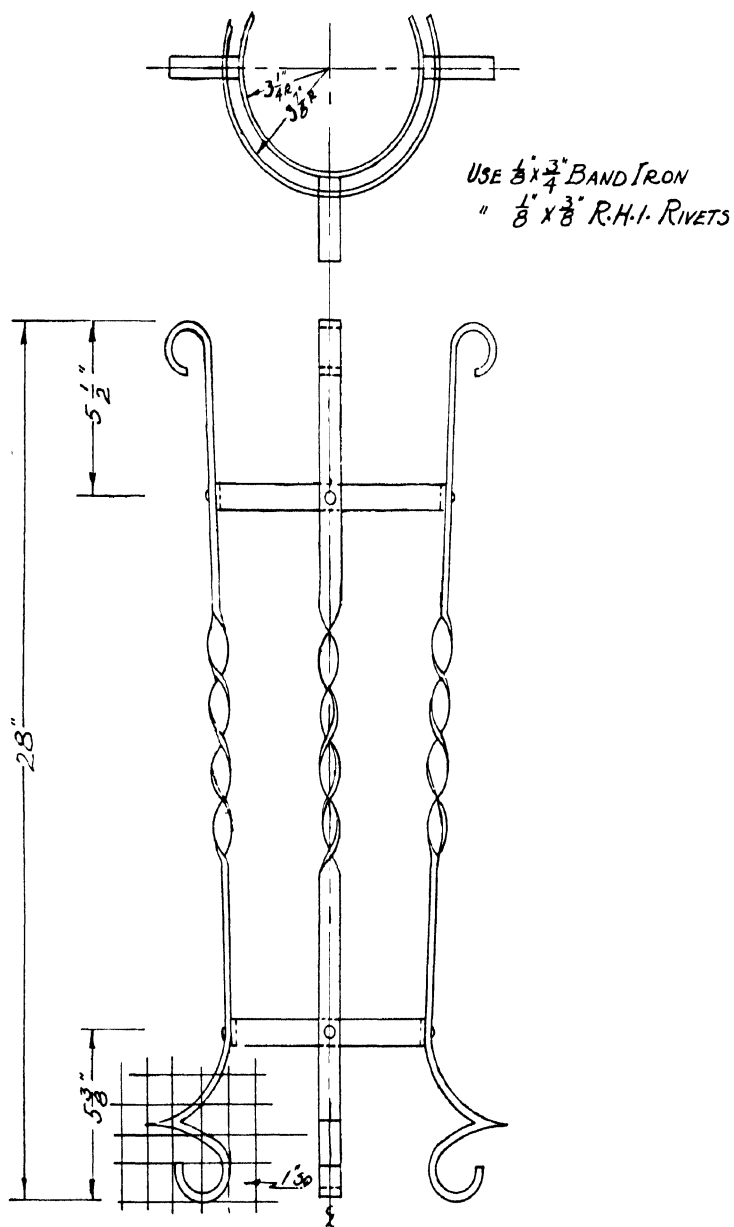


Operations:

1. Draw full-scale layout of pieces.
2. Determine the length of each piece, and cut.
3. Shape pieces as required.
4. Locate and drill holes in pieces.
5. Cut pipe to length, and drill for 3/16 roundhead rivets.
6. Assemble pieces.
7. Shape toppiece, drill, and rivet.
8. Select or make trays, and rivet.
9. Apply finish.

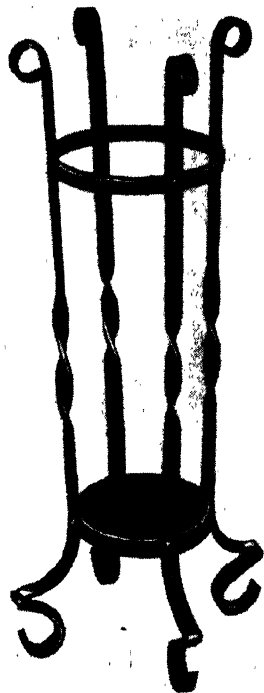
References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).



UMBRELLA RACK

UMBRELLA RACK



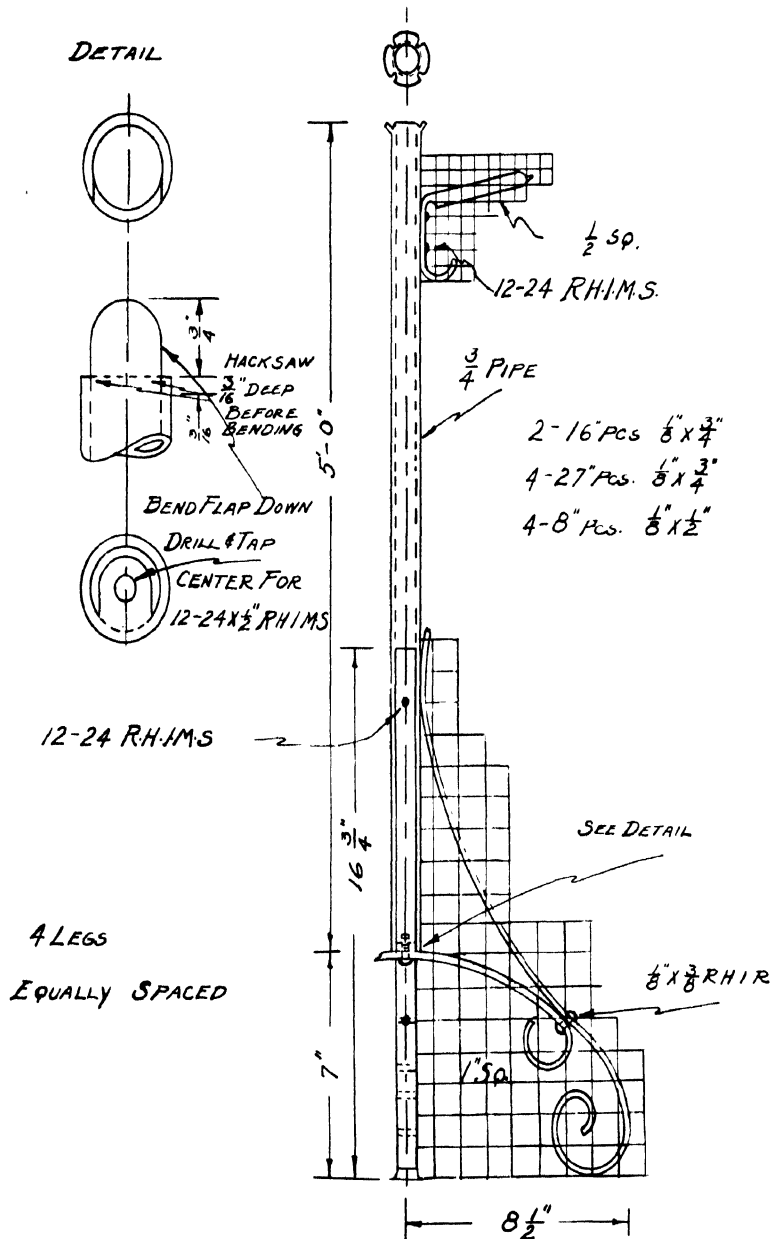
Operations:

1. Draw full-scale layout for feet.
2. Determine the length of each piece, and cut.
3. File ends square.
4. Shape pieces as required.
5. Locate and drill holes.
6. Lay out and twist legs.
7. Make rings.
8. Locate and drill holes in ring.
9. Rivet pieces together.
10. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

DETAIL



COSTUMER

COSTUMER



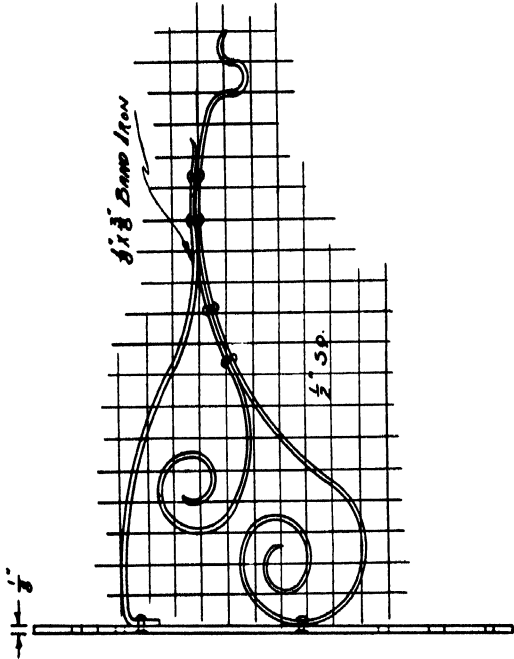
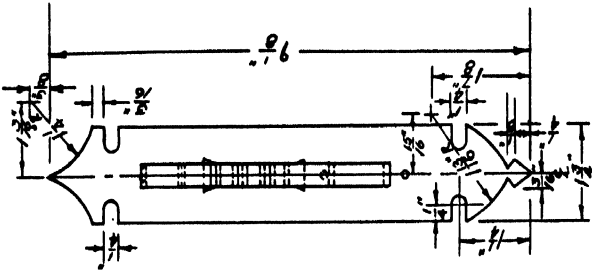
Operations:

1. Draw full-scale layout of each piece.
2. Determine the length of each piece.
3. Cut pieces, and file ends.
4. Shape pieces for base.
5. Locate and drill holes in pieces for base.
6. Cut pipe to length; flare top, and bend flap over bottom opening.
7. Locate and drill holes in pipe.
8. Fasten base to pipe. Secure center to pipe with screw.
9. Bend clothes hooks as shown from $\frac{1}{8}$ by $\frac{1}{2}$ -in. stock.
10. Lay out and drill holes in hooks and pipe.
11. Tap holes in pipe, and fasten hooks.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

WALL BRACKET



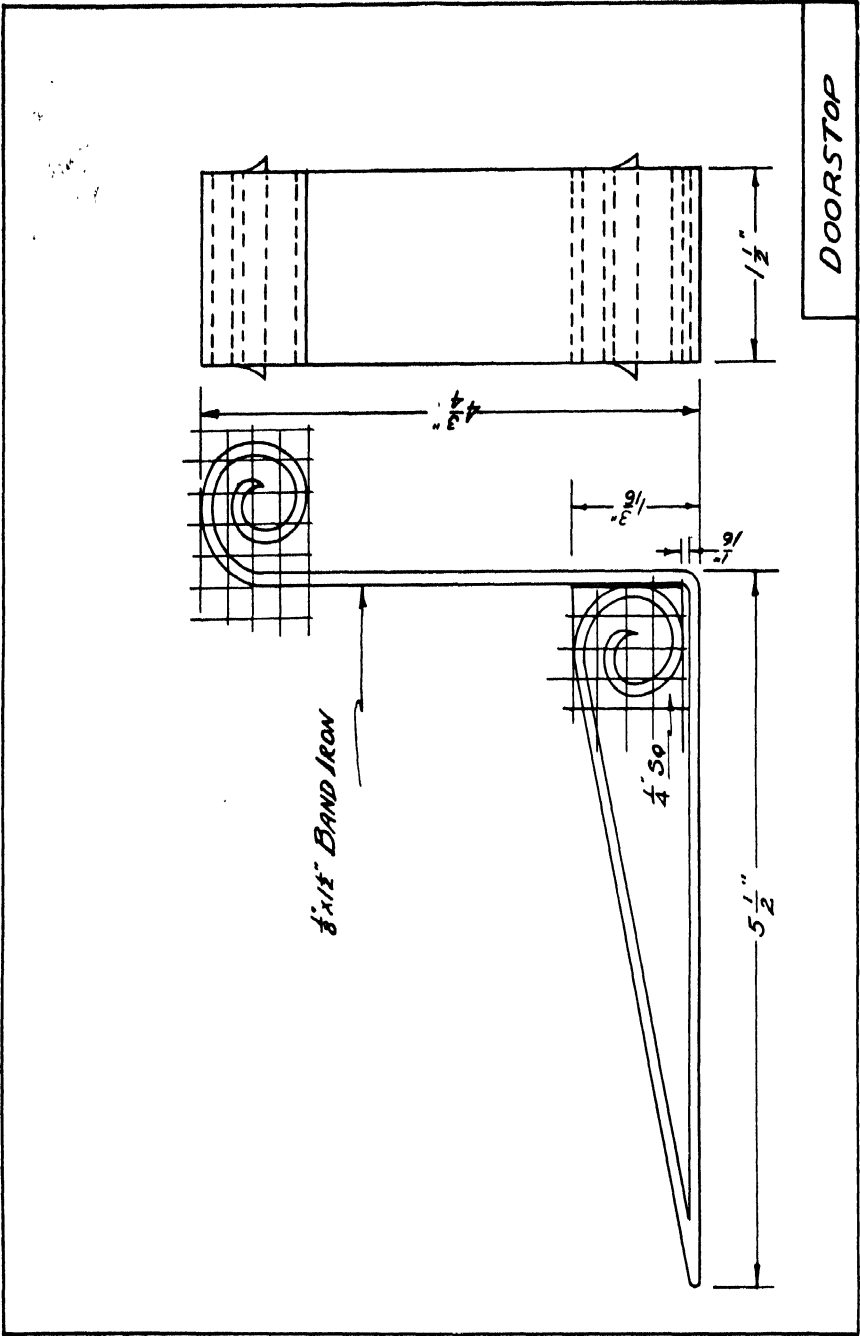
NOTE - USE 5/8" x 3/4" RH IR

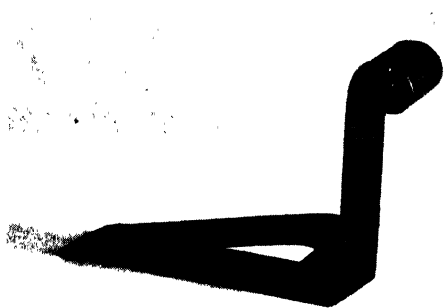
WALL BRACKET*Operations:*

1. Make full-size layout for all pieces.
2. Determine the length of each piece from the layout.
3. Cut pieces to length.
4. Square and flare the ends of scroll pieces.
5. Bend pieces, as shown on drawing.
6. Locate holes, center punch, and drill.
7. Lay out wall plate, drill, hack saw, and file to size.
8. Rivet pieces together.
9. Apply finish.

Reference:

Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).

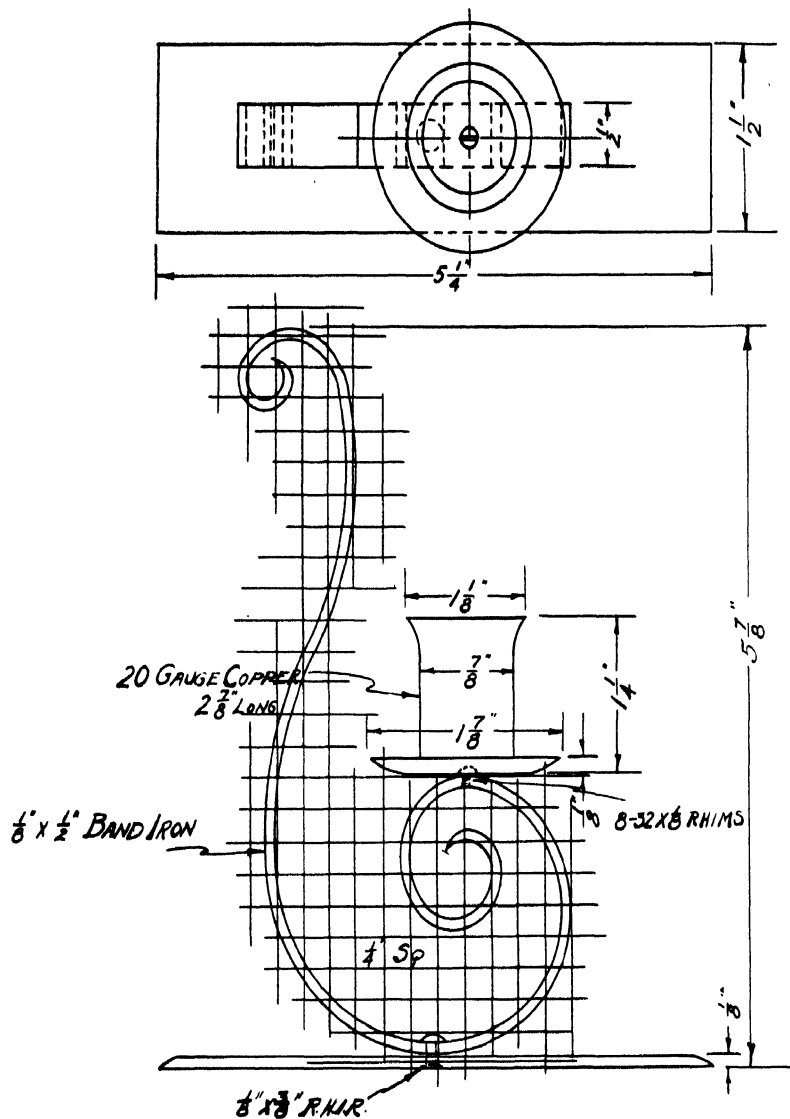


DOORSTOP*Operations:*

1. Draw full-scale layout of piece.
2. Obtain 20-in. length of $\frac{1}{8}$ by $1\frac{1}{2}$ -in. band iron.
3. File end square, and flare same.
4. Form scroll on opposite sides ($15\frac{1}{8}$ in. overall).
5. Measure in $5\frac{1}{2}$ and 11 in. from one end, and scribe lines.
6. Bend in U shape with scroll $5\frac{1}{2}$ in. on the inside.
7. Bend $5\frac{1}{2}$ -in. leg down to base.
8. Finish as desired.

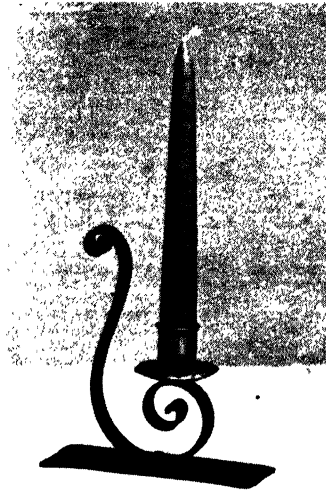
References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials* (Bruce, Milwaukee).



CANDLESTICK

CANDLESTICK



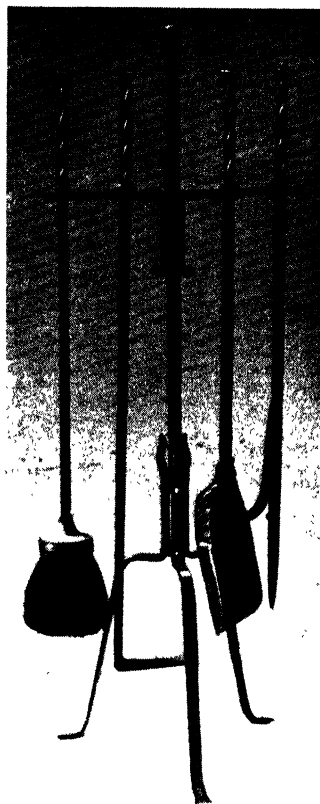
Operations:

1. Draw full-scale layout of scroll.
2. Determine length of scroll piece.
3. Cut pieces to length.
4. Bend pieces as shown.
5. Locate and drill holes.
6. Rivet pieces together.
7. Cut, form, and solder pieces for candleholder.
8. Drill and fasten candleholder.
9. Apply finish.

Reference:

Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials* (Bruce, Milwaukee).

FIREPLACE SET



Operations:

THE STAND

1. Draw full-scale design of legs and holder, detail A.
2. Cut pieces to length.
3. Forge top of post.
4. Shape legs and toppieces.
5. Locate and drill holes.
6. Tap and drill holes in hex. nuts. File hole square to fit post.
7. Assemble legs to post.
8. Rivet holder to post.
9. Apply finish.

LOG HOOK

1. From the drawing, determine length of each piece
2. Cut pieces to length, and file ends evenly.

3. Forge and twist handle.
4. Fasten ring to handle.
5. Forge the taper, and form the curve as on the drawing.
6. Apply finish.

THE POKER

1. From drawing, determine the length of the piece.
2. Cut piece to length, and file ends evenly.
3. Forge and twist handle.
4. Fasten ring to handle.
5. Forge bottom as shown.
6. Apply finish.

THE SHOVEL

1. Draw pattern for the shovel.
2. Cut handle. Cut and shape sheet metal.
3. Forge and twist handle.
4. Fasten ring.
5. Bend handle to fit shovel.
6. Rivet shovel to handle.
7. Apply finish.

THE SWEEPER

1. Determine the length of the handle.
2. Mark off portion to be twisted, and twist.
3. Forge top of handle.
4. Fasten ring to handle.
5. Attach brush.
6. Apply finish.

References:

- Bollinger, J. W., *Elementary Wrought Iron* (Bruce, Milwaukee).
Tustison, F. E., and Kranzusch, R. F., *Metalwork Essentials*
(Bruce, Milwaukee).

INDEX

- Bracket, wall, 24, 26, 28, 30
Bridge lamp, 82; colonial, 74, 76
Candelabra, 12
Candlestick, 10, 106
Colonial bridge lamp, 74, 76
Costumer, 100
Door knocker, 46
Doorstop, 104
End table, 44
Fernery, 94
Finishes, 9
Fireplace screen, 90
Fireplace set, 108
Floor lamp, 78, 80, 84
Foot scraper, 48
Jardiniere, 92
Lamp, bridge, 82; colonial
bridge, 74, 76; floor, 78, 80, 84;
radio, 62, 66; table, 60, 64, 68,
70
Lantern and bracket, 72
Magazine holder, 58
Magazine rack, 56
Occasional table, 36, 40
Pedestal, 96; table, 14, 16, 20
Plant stand, 18, 22
Radio lamp, 62, 66
Serving tray, 34
Smoking stand, 50, 52, 54
Stand, plant, 18, 22; smoking, 50,
52, 54
Table, 32, 42; end, 44; occa-
sional, 36, 40
Table lamp, 60, 64, 68, 70
Table pedestal, 14, 16, 20
Taboret, 38
Torchère, 86
Tray, serving, 34
Umbrella rack, 98
Wall bracket, 24, 26, 28, 30, 102
Wood basket, 88

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